SOUTHERN AFRICAN CUMACEA
PART 3
FAMILIES LAMPROPIDAE AND CERATOCUMATIDAE

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(With 16 figures and 1 table)

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ABSTRACT

The Lampropidae in southern Africa are represented by eleven species in five genera. Seven species are new: *Platysympus camelus*, *P. depressus*, *P. compressus*, *P. phylloides*, *Paralamprops margidens*, *Hemilamprops glabrus* and *Hemilamprops* sp. *Hemilamprops pellucidus* and *Bathylamprops calmani* are redescribed and new figures are given. Adult males of *Paralamprops* (formerly *Platytyphlops*) *peringueyi* and *Stenotyphlops spinulosus* are described and figured for the first time. The generic diagnosis of *Paralamprops* is altered to accommodate information obtained from adult males of *P. peringueyi*, while the genus *Platytyphlops* is invalidated.

Keys are given to the genera of the Lampropidae, the southern African members of the family, the world species of *Paralamprops*, *Platysympus*, *Bathylamprops*, and *Ceratocuma*, and to the species of *Hemilamprops* from the southern hemisphere.

The general distribution of lampropids is discussed and a more detailed account given of the southern African representatives. It is concluded that lampropids are bipolar in distribution, preferring deep and/or cold waters and avoiding the tropics. No member of the family is found at depths of less than 188 m in these waters.

The only southern African member of the Ceratocumatidae, *Ceratocuma horridum*, is redescribed and refigured and is considered to belong to a local subspecies, *C. horridum australe*, which is polymorphic. The ceratocumatids are too poorly known to generalize effectively about their distribution, but they all appear to be deep-water, essentially Atlantic forms. None has been found at depths of less than 196 m or further from the Atlantic than the south-east coast of South Africa and Kerguelen.

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INTRODUCTION

This is the third in a series of papers on the Cumacea (Crustacea) of southern Africa. The first two deal with the family Bodotriidae (subfamily Vaunthompsoniinae (Day 1975), subfamily Bodotriinae (Day 1978)). The reader is referred to the first of these for a discussion of the morphology and terminology of the group as a whole.

Since the Lampropidae are essentially cold-loving forms, the only species occurring in these waters are found at depths greater than 188 m where temperatures are uniform and generally low (less than 12°C in these latitudes). Only four species have previously been described from the southern African region: *Hemilamprops pellucidus* Zimmer, 1908, *Platytyphlops peringueyi* Stebbing, 1912, and *Stenotyphlops spinulosus* Stebbing, 1912, from southern Africa and *Bathylamprops natalensis* Jones, 1969, from the South-western Indian Ocean. The other species previously known from the African continent is *Bathylamprops calmani* Zimmer, 1908, from deep waters off equatorial east Africa. A further six species are described here, bringing the total number of named species for southern Africa to ten. There is a further species (probably of *Hemilamprops*), but all the individuals are too badly damaged to allow adequate description.

The Ceratocumatidae, a family known until recently (Jones 1969) from a single species, appear to occur only in waters deeper than 196 m. One of the two findings of the type species, *Ceratocuma horridum* Calman, 1904, was recorded by Stebbing (1912) from Natal. Further individuals are now available but they are morphologically variable and until more material is forthcoming it will not be possible to say with certainty whether all individuals belong to Calman's species.

MATERIAL AND STATION DATA

The vast bulk of the material available to the author was provided by the South African Museum (SAM). Part of it was obtained by the S.S. *Pieter Faure* in 1898–1907 from deep waters round the coast of South Africa, and the remainder was collected aboard the R.V. *Meiring Naude* in 1976–1977 during a survey conducted by the Museum in deep waters off the east coast of South Africa. A few of the samples come from the deepest stations of transects conducted by the Zoology Department of the University of Cape Town (UCT) aboard the University's Research Vessel, the R.V. *Thomas B. Davie*, off Still Bay and Lambert's Bay.

Depth records for some of the *Pieter Faure* stations are approximate and have been estimated from charts. Newly available information on depths off the Cape Peninsula shows that the depth for SAM–A10602 is about 800 m, rather than 400 m as previously estimated.

Figure 1 shows the positions at which lampropids and ceratocumatids were found. The code letters used are as follows:

South African Museum
SAM: *Pieter Faure* samples
SM: *Meiring Naude* samples

Zoology Department, University of Cape Town
LBT: transect at Lambert's Bay, 200 km north of Cape Town
SST: transect at Still Bay, 270 km east of Cape Town
WCD: benthic survey off the western Cape Province

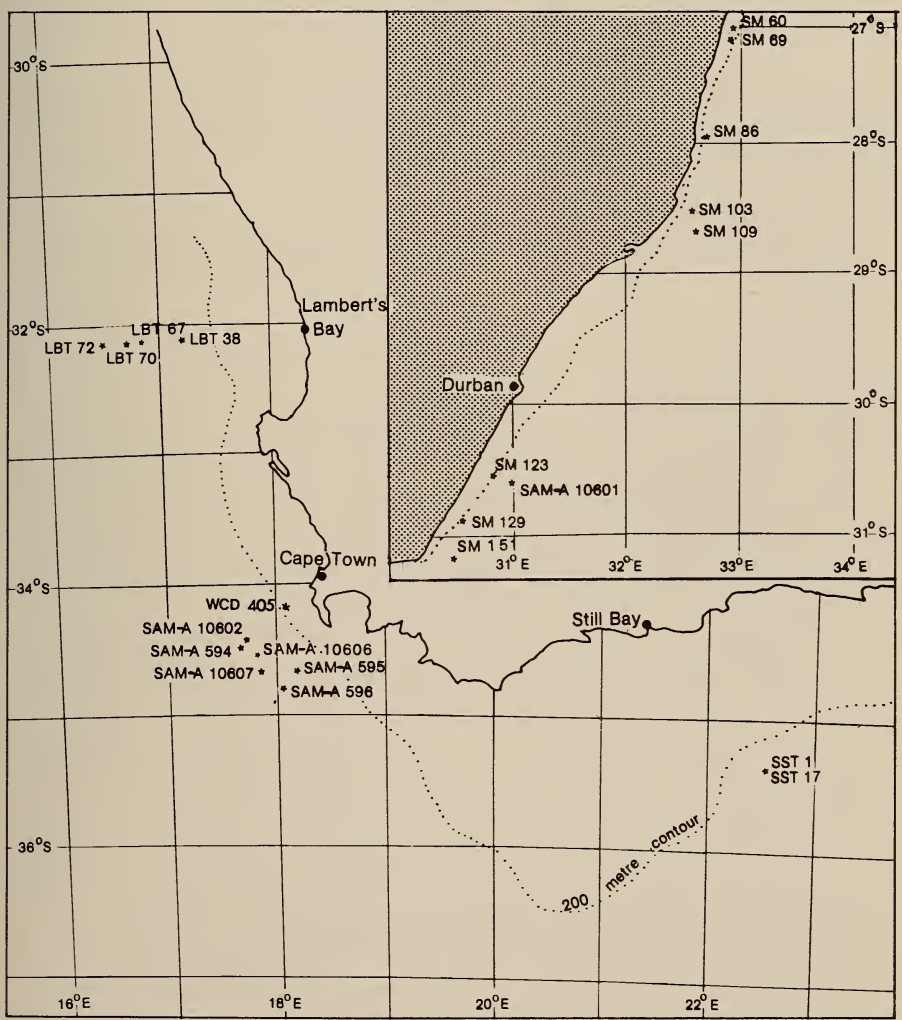

Fig. 1. Coastline of the Cape Province showing positions of stations at which lampropids and ceratocumatids were collected. Inset: coastline of Natal.
Dotted line indicates 200 m depth contour. See text for explanation of code letters.

METHODS

Collections: a variety of gear was used for sampling: dredges in the *Pieter Faure* and *Meiring Naude* programmes, and Van Veen grabs and Cape Town dredges in the *Thomas B. Davie* programmes.

Length measurements were made from the anterior tip of the carapace to the posterior tip of the telson. Exhalant siphons and uropods were excluded in every case.

KEY TO THE SOUTHERN AFRICAN LAMPROPIDAE AND CERATOCUMATIDAE

It should be noted that this key is designed to assist in the identification even of damaged animals and those of varying ages in which the sex may be difficult to determine. For this reason it should always be used in conjunction with the generic keys for final identification.

1 Telson small, semicircular, lacking apical spines (may be deflected over anal valves) (Fig. 15B); carapace sculptured into numerous rounded (Fig. 15A) or digitiform (Fig. 16A) processes ..... *Ceratocuma horridum australe* (Figs 15 & 16)
– Telson large, elongate, with at least three apical spines (Fig. 2I); sculpturing variable but not as above 2
2 Carapace rounded, more or less circular in cross-section, totally devoid of marginal or lateral carinae or longitudinal ridges on posterior half at least (Fig. 11A)..... 3
– Carapace dorsoventrally flattened anteriorly at least, marginal or lateral carinae or longitudinal ridges present on most or all of carapace (Figs. 2A, 4A)..... 6
3 Carapace with irregular transverse rows of minute denticles; pseudorostrum almost one-fifth total length of carapace..... *Bathylamprops calmani* (Fig. 10)
– Carapace without transverse rows of denticles; pseudorostrum distinctly less than one-fifth total length of carapace (Fig. 11A) 4
4 Pseudorostrum truncate anteriorly with short, poorly defined ventrolateral carinae; telson with five spines apically and none laterally..... *Hemilamprops glabrus* (Fig. 13)
– Pseudorostrum pointed anteriorly, without lateral carinae (Fig. 11A); telson with three apical and at least five pairs of lateral spines 5
5 Anterolateral corner of carapace with several long, slender spines; telson less than half length of peduncle of uropod..... *Hemilamprops* sp. (Fig. 14)
– Anterolateral corner of carapace smooth or minutely denticulate; telson at least two-thirds length of peduncle of uropod..... *Hemilamprops pellucidus* (Figs 11 & 12)
6 Carapace extraordinarily flat and leaf-like, almost as wide as abdomen is long..... *Platysympus phylloides* (Fig. 6)
– Carapace rounded or flattened but not leaf-like, not nearly as wide as abdomen is long (Fig. 8A) 7
7 Carapace and body with a number of longitudinal ridges formed by rows of small denticles; carapace almost rectangular in dorsal outline; fifth pereiopod reduced to two segments *Stenotyphlops spinulosus* (Figs 2 & 3)
– Carapace with a single sharp marginal carina; square or oval in dorsal outline; fifth pereiopod consisting of at least four segments..... 8
8 Abdomen twice as long as cephalothorax; carapace almost square in dorsal view..... *Paralamprops peringueyi* (Fig. 4)
– Abdomen subequal in length to cephalothorax; carapace oval in dorsal view (Fig. 7B).... 9
9 Marginal carina of carapace strongly dentate; exopod present on pereiopod 2 of female *Paralamprops margidens* (Fig. 5)
– Marginal carina of carapace not dentate (Fig. 6A, C); exopod absent from pereiopod 2 of female 10

10 Carapace smoothly oval or with a few small, rounded projections; not laterally compressed dorsal to marginal carina; middorsal carina hardly evident.....
Platysympus depressus (Fig. 7)
– Carapace smooth, laterally compressed dorsal to marginal carina (Fig. 8A); middorsal carina evident (Fig. 8B).....11
11 Dorsal edge of carapace smoothly arched; pseudorostrum pointed anteriorly in lateral view
Platysympus compressus (Fig. 8)
– Dorsal edge of carapace sinusoidal; pseudorostrum dorsoventrally truncate anteriorly in lateral view.....*Platysympus camelus* (Fig. 9)

Family **Lampropidae** Sars, 1878

Diagnosis

Antenna 1 with flagellum well developed. Antenna 2 of male with short segments, of female with at least three segments. Mandibles of normal (boat) shape. Palp of maxilla 1 absent or bearing one or two filaments. Exopods present on maxilliped 3 and pereiopod 1 in both sexes and on pereiopods 2 to 4 in male. Exopods present on pereiopod 2 and rudimentary on pereiopods 3 and 4, or absent from all three, in female. Pleopods in male 0 to 3 pairs, with an outer process to the inner ramus. Telson moderate to large, well developed post-anally, with three to five apical spines.

Type genus

Lamprops Sars, 1863.

Remarks

The presence of a well-developed telson with at least three apical spines together with the well-developed first antenna is characteristic of the family.

Earlier workers tended to distinguish a greater number of families than are now accepted. The families Chalarostylidae, Paralampropidae, Platysympodidae, Pseudodiastylidae and Lampropidae of Stebbing (1913) are now all included in the larger family Lampropidae.

The family is well defined and consists at present of ten genera, five of which are represented in the present collection. One of these (*Stenotyphlops* Stebbing, 1912) is known only from southern Africa.

A problematic feature of the taxonomy of the family is the fact that, being deep-water forms for the most part, relatively few species are known and many of these are represented by only one sex. Since the major distinction between some genera (notably *Lamprops*, *Mesolamprops* and *Hemilamprops*) is the number of pairs of pleopods present in adult males (zero, two and three pairs respectively), females and juveniles cannot always be placed in a genus with any certainty. This in turn makes it difficult to construct a useful key to the genera. In the key below, an attempt has been made to use characters other than those found only in adult males, but these are not very clear-cut. The geographic distribution of the species of *Lamprops*, however, shows that it is essentially a shallow-water genus confined to high latitudes of the Northern hemisphere. The distribution of *Hemilamprops*, on the other hand, is much wider and its species

tend to occur in deeper waters. Thus there is little doubt that the species from deep water in the Southern hemisphere for which only females are known—*H. lotusae* Băcescu, 1969, *H. ultimaespei* Zimmer, 1921, *H. glabra* sp. nov. and *Hemilamprops* sp.—are, indeed, members of the genus *Hemilamprops*. The single specimen of *Lamprops? comata* Zimmer, 1907, from Tierra del Fuego is a fragmentary female, so that its systematic position must remain indeterminate for the present.

The presence in the collection of adult males of both *Stenotyphlops* and *Platytyphlops* with three pairs of pleopods throws some light on the relationship between these genera and closely allied ones. Details of the findings are presented in the discussion of *Paralamprops* on page 147.

The genera of the family as a whole are morphologically unremarkable for the most part, but for the fact that in several cases the carapace is very strongly flattened dorsoventrally, with a single, sharp lateral carina encircling the entire carapace apart from the posterior edge (and here called a *marginal carina* to distinguish it from the more usual lateral carinae found widely in several families). The reason for this adaptation is not clear, but since all the species exhibiting this character are deep-water forms, it may have evolved as a means of increasing the surface area to prevent sinking into the oozy mud of the seafloor.

A singular genus, described by Băcescu (1972), is *Archaeocuma*. It is monotypic and known only from the Peruvian Trench. It is distinguished by the presence in both sexes of a single pair of pleopods. In all other characters it is typically lampropid.

KEY TO THE GENERA OF LAMPROPIDAE

All males have three pairs of pleopods unless otherwise stated.

1 Antenna 1 with third segment no longer than second and accessory flagellum minute; telson and peduncle of uropods more than four times length of telsonic somite ..... *Pseudodiastylis* Calman, 1905
– Antenna 1 with third segment no longer than second and accessory flagellum well developed *or* with third segment elongate and accessory flagellum very small; telson and peduncle of uropod no more than four times length of telsonic somite.....2
2 Telson small, subequal in length to telsonic somite and a third length of peduncle of uropod (female unknown).....*Chalarostylis* Norman, 1879
– Telson distinctly longer than telsonic and at least half length of peduncle of uropod.....3
3 Pereiopod 5 reduced to a minute, 2-segmented projection; a single filament on palp of maxilla 1.....*Stenotyphlops* Stebbing, 1912
– Pereiopod 5 normal, or if reduced, at least 4-segmented; palp of maxilla 1 absent or with two filaments.....4
4 Basis of pereiopod 4 longer than entire length of pereiopod 5.....5
– Basis of periopod 4 subequal to, or shorter than, entire length of pereiopod 5.....6
5 Basis of maxilliped 3 much shorter than remaining segments together; male and female both with one pair of pleopods.....*Archaeocuma* Băcescu, 1972
– Basis of maxilliped 3 not shorter than remaining segments together; male with three pairs of pleopods and female with none.....*Paralamprops* Sars, 1887
6 Maxilla 1 lacking palp; exopods absent from pereiopods 2–4 in female; carapace with strong marginal carina.....*Platysympus* Stebbing, 1912

– Palp of maxilla 1 with two filaments; exopods normal on pereiopod 2 and rudimentary on pereiopods 3 and 4 in female; number of pairs of pleopods in male 0, 2 or 3; carapace without marginal carina.....7
7 Pseudorostrum at least a fifth of total length of carapace; third segment of antenna 1 longer and considerably more slender than second.....*Bathylamprops* Zimmer, 1908
– Pseudorostrum distinctly less than a fifth total length of carapace; third segment of antenna 1 not much longer or much more slender than second 8
8 Male without pleopods; antennal notch small but distinct; eye present; basis of pereiopod 1 approximately equal in length to rest of limb.....*Lamprops* Sars, 1863
– Male with two pairs of pleopods; antennal notch present or absent; eye present or absent; basis of pereiopod 1 shorter than rest of limb.....*Mesolamprops* Given, 1964
– Male with three pairs of pleopods; antennal notch usually absent; eye present or absent; basis of pereiopod 1 distinctly shorter than rest of limb.....*Hemilamprops* Sars, 1883

Stenotyphlops Stebbing, 1912

Generic diagnosis

Carapace not strongly flattened. Eye absent. Both flagella of antenna 1 well developed. Palp of maxilla 1 with one filament. Exopods of pereiopods 3 and 4 of female rudimentary. Pereiopod 5 reduced to a minute, 2-segmented projection. Male with three pairs of pleopods.

Type species

S. spinulosus Stebbing, 1912 (by monotypy).

Remarks

The genus is monotypic and the single species is known only from southern Africa. The combined presence of a single filament on the palp of maxilla 1 and the greatly reduced fifth pereiopod is diagnostic. The adult male described below is the first known for the genus. The presence of three pairs of pleopods confirms *Stenotyphlops* as typically lampropid, while the extreme reduction of the fifth pereiopod and the nature of maxilla 1 clearly separate it from the other genera in the family. In general morphology it is otherwise very close to *Paralamprops*.

Distribution of Stenotyphlops

Deep water off southern Africa.

Stenotyphlops spinulosus Stebbing, 1912

Figs 2–3

S. spinulosus Stebbing, 1912: 162–163, pl. 60.

Records

SAM–A10602 (PF 17440)	34°25′S 17°45′E	800 m	1 ♂: 10,5 mm; 3 ♀♀: 11,2 mm and damaged; 4 juvs
SAM–A10607 (PF 16982)	34°40′S 17°50′E	1 200 m	1 adult ♂: 13,8 mm; 1 damaged adult ♀
SM 60	27°09′S 32°58′E	800 m	1 damaged ♂
SM 103	28°32′S 32°34′E	680 m	1 damaged ♂; 1 ovig. ♀: 12,5 mm
SM 123	30°33′S 30°48′E	690 m	2 ♀♀: 7,0 mm and damaged
SM 129	30°53′S 30°32′E	850 m	1 ♂: 9,6 mm; 1 ♀: 9,9 mm

Previous records

Holotype only.

Holotype

Adult female, deposited by Stebbing in the British Museum (Natural History). Type locality: approximately 370–550 m, off the Cape Peninsula (34°25′S 17°50′E).

Description

Ovigerous female, length 12,5 mm (SM 103). Integument slightly translucent, armed with very small denticles. Carapace (Fig. 2A) slightly flattened anteriorly and inflated posteriorly with three longitudinal rows of denticles on either side and two on the anterior sinus. Middorsal carina evident anteriorly

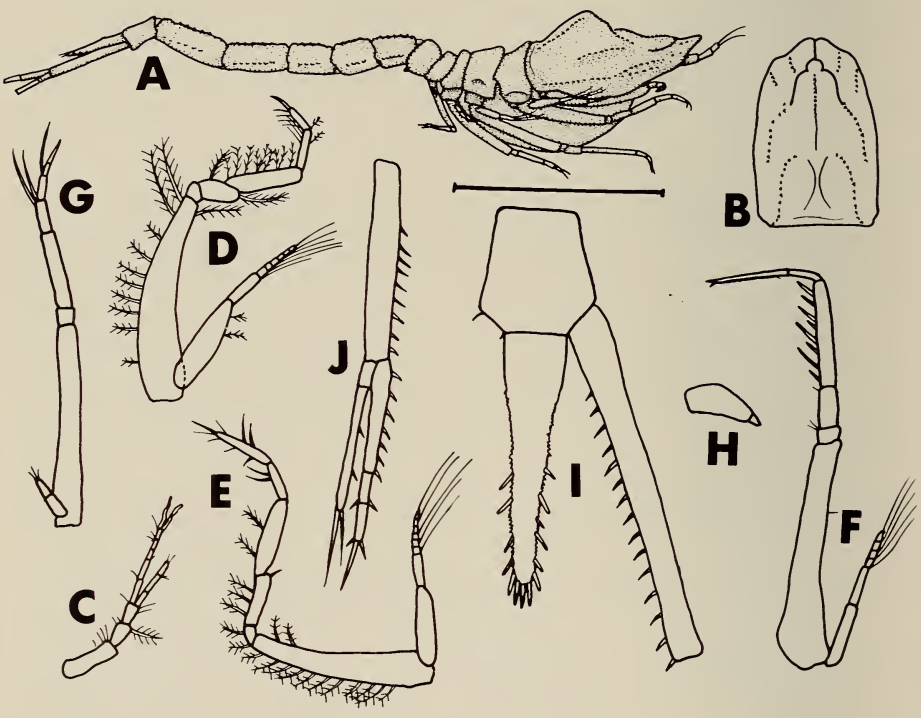

Fig. 2. *Stenotyphlops spinulosus*

Ovigerous female. A. Lateral view. B. Dorsal view of carapace. C. Antenna 1. D. Maxilliped 3. E. Pereiopod 1. F. Pereiopod 2. G. Pereiopod 3. H. Pereiopod 5. I. Telson and peduncle of uropod.

Young female. J. Uropod.

Scale line = 4 mm for A–B; 2 mm for C–G; 1 mm for I–J; 0,5 mm for H.

(Fig. 2B) behind eyelobe, minutely denticulate. Eyelobe eyeless. Carapace inflated posterodorsally on either side of middorsal depression. First three thoracic somites flanged laterally. Abdominal somites cylindrical. Cephalothorax and abdomen subequal in length.

Antenna 1 (Fig. 2C) of moderate size; first segment subequal in length to next two together. Both flagella well developed.

Palp of maxilla 1 with a single filament.

Maxilliped 3 (Fig. 2D) fairly stout, basis subequal in length to rest of limb. Carpus long and parallel-sided, propodus and dactyl slender.

Pereiopod 1 (Fig. 2E) not elongate, basis subequal in length to next four segments together. Ischium small, merus and carpus elongate. Propodus and dactyl cylindrical.

Pereiopod 2 (Fig. 2F) elongate. Basis subcylindrical, carpus long and stout, armed with a row of spines on inner edge. Exopod small and slender.

Pereiopods 3 (Fig. 2G) and 4 similar. Basis subequal in length to rest of limb, merus longest of remaining segments. Dactyl minute. Exopod very small, 2-segmented.

Pereiopod 5 (Fig. 2H) reduced to a minute, 2-segmented stump.

Telson (Fig. 2I) distinctly wider proximally than distally, about three-quarters of length of peduncle or uropod, distally armed with five to six pairs of spines laterally and three single spines terminally. Rami of uropod damaged in adult female. Peduncle of uropod of young female (Fig. 2J) subequal in length to endopod. First segment of exopod much shorter than second. First segment of endopod nearly twice length of second and third together. Endopod longer than exopod by one segment.

Adult male, length 13,8 mm (SAM–A10607). As female, except as follows: carapace (Fig. 3A) less flattened anteriorly and less inflated posteriorly. Ridges on carapace more distinct, not always denticulate. Lateral flanges of thoracic somites scalloped (Fig. 3B).

First segment of flagellum of antenna 1 (Fig. 3C) bearing numerous short aesthetascs. Antenna 2 reaching about half way along length of body. Palp of maxilla 1 (Fig. 3D) illustrated. Segments distal to basis of maxilliped 3 and pereiopod 1 missing. Exopod of pereiopod 2 larger. Pereiopod 3 (Fig. 3E) stouter, dactyl minute and apparently continuous with small terminal spine. Pereiopod 5 (Fig. 3G) longer, but still 2-segmented. Three pairs of normal pleopods present.

Telson (Fig. 3F) shorter, about half length of peduncle of uropod. Armature of peduncle and proximal part of endopod of uropod more extensive. Distal portions missing.

Remarks

No adult males have previously been described. The differences between the female described here and Stebbing's holotype are slight, and the differences between adult male and adult female are within the limits expected between

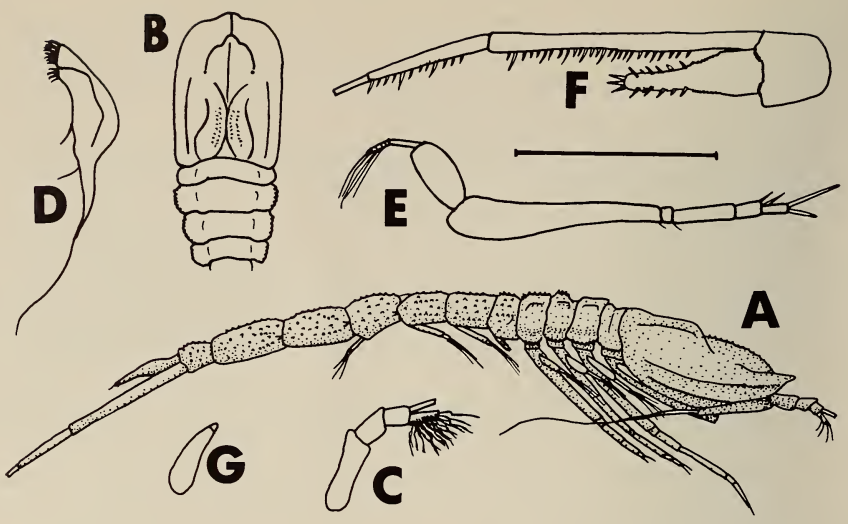

Fig. 3. *Stenotyphlops spinulosus*
Adult male. A. Lateral view. B. Dorsal view of cephalothorax. C. Antenna 1. D. Maxilla 1. E. Pereiopod 3. F. Uropod and telson. G. Pereiopod 5.
Scale line = 4 mm for A–B; 2 mm for C, E–F; 1 mm for D, G.

sexes. Stebbing figures his female with a slightly narrower carapace and a larger first segment of antenna 1. The flagellum of his female has four segments and the present one five. The greatest difference is in the telson: Stebbing figures it as being not very much longer than the telsonic somite and little more than half the length of the peduncle of the uropod. The telsons of both male and female figured here are twice the length of the telsonic somite and in the female is nearly as long as the peduncle of the uropod. In the male the peduncle is much longer, nearly twice as long as the telson. However these differences may simply be due to individual variation since the lengths of the peduncle and telson vary somewhat among the individuals available at present. Apart from this, they agree well with Stebbing's figures and there is little doubt that they belong to the same species.

Distribution

From Cape Point (about 500 to 1 200 m) to Natal (680 to 850 m).

Paralamprops Sars, 1887

Generic diagnosis

Carapace slightly or strongly depressed dorsoventrally with a marginal carina or at least one pair of lateral carinae. Antenna 1 with both flagella well developed. Palp of maxilla 1 absent or with two filaments. Exopods of pereiopods 3 and 4 of female rudimentary or absent. Pereiopod 5 small to

rudimentary, no longer than basis of pereiopod 4. Male with three pairs of pleopods. Telson well developed.

Type species

Paralamprops serratocostata Sars, 1887.

Remarks

The genus has consisted up to now of seven species: *P. serratocostata* Sars, 1887, *P. orbicularis* Calman, 1904, *P. aspera* Zimmer, 1907, *P. semiornata* Fage, 1928, *P. grimaldi* Fage, 1928, *P. arafurensis* Jones, 1969, and *P. rossi* Jones, 1971. The genus *Platytyphlops* was established by Stebbing (1912) on the basis of several specimens including a fragmentary ovigerous female and at least one young male. He decided that the male was probably mature and therefore characterized the genus as having no pleopods in the male and a greatly reduced fifth pereiopod in both sexes. One fully adult and several subadult males of the same species are now available, however, and possess three pairs of normal pleopods. They should thus be placed in *Paralamprops*. It also turns out that the reduction of the fifth pereiopod is less evident in the adult male than in immature males or adult females in *P. peringueyi* and that, in fact, the limb is reduced to some extent in all species of *Paralamprops*. But the degree of reduction varies considerably, reaching its limit in *P. peringueyi*. Thus the generic diagnosis of *Paralamprops* has been slightly altered accordingly.

The genus is morphologically rather variable. The first maxilla in *P. serratocosta* and *P. margidens* sp. nov. lacks a palp while in *P. orbicularis*, *P. semiornata*, *P. grimaldi* and *P. peringueyi* there is a normal palp with two filaments. In these last four species and in *P. rossi* the carapace is very strongly flattened with a single, sharp marginal carina forming a wide, flat, flange encircling the entire carapace apart from the extreme posterior edge. The first maxilla is not described for *P. rossi*, *P. aspera* or *P. arafurensis*, all of which are known from single specimens which would have been badly damaged by dissection of the anterior mouthparts. In *P. serratocostata*, which lacks a maxillary palp, the carapace is not strongly flattened dorsoventrally but, in common with *P. arafurensis* and *P. aspera*, does possess a number of longitudinal ridges. *P. margidens* also lacks a maxillary palp, but the carapace is somewhat flattened and bears a single dentate marginal carina, thus being intermediate between the two types described above.

Calman (1912) was of the opinion that the absence of a palp on maxilla 1 was 'so important and unexpected that it might justify the creation of a new genus'. The present author agrees that this character is of considerable significance and suggests that in the future *Paralamprops* may well be split into two genera on the combined characters of the first maxilla and the carapace. However, as Jones (pers. comm.) has pointed out, the practical difficulty of examining the maxilla in rare species and the lack of information on the adults of many of the species under discussion, precludes the splitting of the genus at present.

Stenotyphlops, distinguished by a single filament on the palp of maxilla 1, a greatly reduced fifth pereiopod and several longitudinal ridges on the carapace, is very close to *Paralamprops*, as is *Archaeocuma*, which is distinguished by a single pair of pleopods. The most closely allied genus of all is *Hemilamprops*. In fact, it is difficult to find a really satisfactory set of characters to distinguish *Hemilamprops* from some members of *Paralamprops*, other than the roundness of the carapace and shortness of the abdomen in *Hemilamprops*, and the fact that there is little or no reduction of the fifth pereiopod in this genus. However, these characters are easily distinguishable and seem to be uniform. In order to avoid making *Hemilamprops* unwieldy and even more diverse than it is at present, the two genera must be kept apart for convenience' sake.

Hemilamprops mawsoni Hale, 1937, which was not a satisfactory member of that genus, can, however, now be placed in *Paralamprops*, where it is very similar to *P. rossi*. This brings the total number of species of *Paralamprops* to ten.

Distribution of Paralamprops

Known at depths from 232 to 3 789 m in the Atlantic, Antarctic and East Indies.

KEY TO THE SPECIES OF *PARALAMPROPS*

1 Carapace with a single, sharp marginal carina 2
– Carapace with at least three pairs of lateral and/or dorsolateral carinae 8
2 Carapace no more elevated posteriorly than anteriorly 3
– Carapace more elevated posteriorly than anteriorly 4
3 Telson little longer than telsonic somite; second and third segments of antenna 1 subequal in length; ischium of pereiopod 1 about as wide as long
P. orbicularis Calman, 1904—N. Atlantic
– Telson more than twice length of telsonic somite; third segment of antenna 1 half length of second; ischium of pereiopod 1 much wider than long
P. semiornata Fage, 1928—W. Portugal
4 Telson nearly equal in length to last two somites together 5
– Telson about half length of last two somites together 7
5 Marginal carina strongly dentate ..... *P. margidens* sp. nov.
– Marginal carina smooth 6
6 Minute exopods on pereiopods 3 and 4 of female; carapace not transversely ridged in middorsal gutter; pseudorostrum pointed anteriorly in dorsal view
P. mawsoni (Hale, 1937)—Antarctic
– No exopods on pereiopods 3 and 4 of female; carapace lightly ridged transversely in middorsal gutter; pseudorostrum rounded anteriorly in dorsal view
P. rossi Jones, 1971—Ross Sea
7 Fifth pereiopod 5-segmented (female) or 6-segmented (male), much less than half length of pereiopod 4; basis of pereiopod 2 shorter than rest of limb .....
P. peringueyi (Stebbing, 1912)—South Africa
– Fifth pereiopod 7-segmented, as long as basis of pereiopod 4; basis of pereiopod 2 longer than rest of limb ..... *P. grimaldi* Fage, 1928—Azores
8 Middorsal carina not serrate; telson little narrower posteriorly than anteriorly with five spines transversely across apex ..... *P. arafurensis* Jones, 1969—East Indies
– Middorsal carina serrate; telson distinctly narrower posteriorly than anteriorly with three apical spines 9
9 Telson no more than twice length of telsonic somite .....
P. serratocostata Sars, 1887—Kerguelen
– Telson three times length of telsonic somite ..... *P. aspera* Zimmer, 1907—Antarctic

Paralamprops peringueyi (Stebbing, 1912)

Fig. 4

Platytyphlops peringueyi Stebbing, 1912: 159–161, pls 58–59.

Records

SAM–A596	(PF 17585)	34°48′S 18°03′E	369–554 m	3 ♀♀: 9,3 mm, 9,9 mm, damaged (paratypes)
SAM–A10602	(PF 17440)	34°25′S 17°45′E	800 m	1 adult ♂: 14,7 mm; 1 damaged subadult ♂; 3 ♂♂: 7,7–10,6 mm; 3 ♀♀: 8,0–16,0 mm; 2 damaged juvs
SAM–A10606	(PF 16769)	34°37′S 17°50′E	1 394 m	1 ovig. ♀: 14,7 mm

Previous records

Type locality only.

Holotype

Not designated: syntypes include ovigerous female and young males from two samples (PF 17585 and PF 17643), deposited in the British Museum (Natural History). Type locality: between 370 and 550 m, off Cape Point (34°48′S 18°03′E).

Description

Adult male, length 14,7 mm (SAM–A10602). Integument with minute triangular denticles. Sides of carapace strongly depressed (Fig. 4A), marginal carina very evident; median part of carapace compressed laterally, slightly more elevated posteriorly than anteriorly. Middorsal line defined anteriorly by extremely well-developed carina and posteriorly by a narrow gutter flanked by a pair of flattened dorsal elevations, denticulate on their anterior edges and bent outwards slightly (Fig. 4B). Eyelobe small, eyeless, flanked by flattened, upturned, lateral extensions of pseudorostral lobes. Carapace slightly longer than wide.

First pedigerous somite exposed dorsally only; second to fourth slightly flanged laterally, fifth cylindrical. Cephalothorax more than three-quarters length of cylindrical abdomen.

Antenna 1 (Fig. 4C) fairly large; first segment longer than next two together. Flagellum elongate, 4-segmented. Accessory flagellum 5-segmented with numerous short aesthetascs on basal segment.

Palp of maxilla 1 with two filaments.

Maxilliped 3 (Fig. 4D) short, leg-like. Merus slightly expanded, carpus and propodus cylindrical, subequal in length.

Basis of pereiopod 1 (Fig. 4E) stout, ischium slightly expanded. Carpus slightly longer than ischium and merus together. Part of propodus and dactyl missing. Exopod large and stout, basal segment almost circular.

Basis of pereiopod 2 (Fig. 4F) fairly short, carpus longer than ischium and

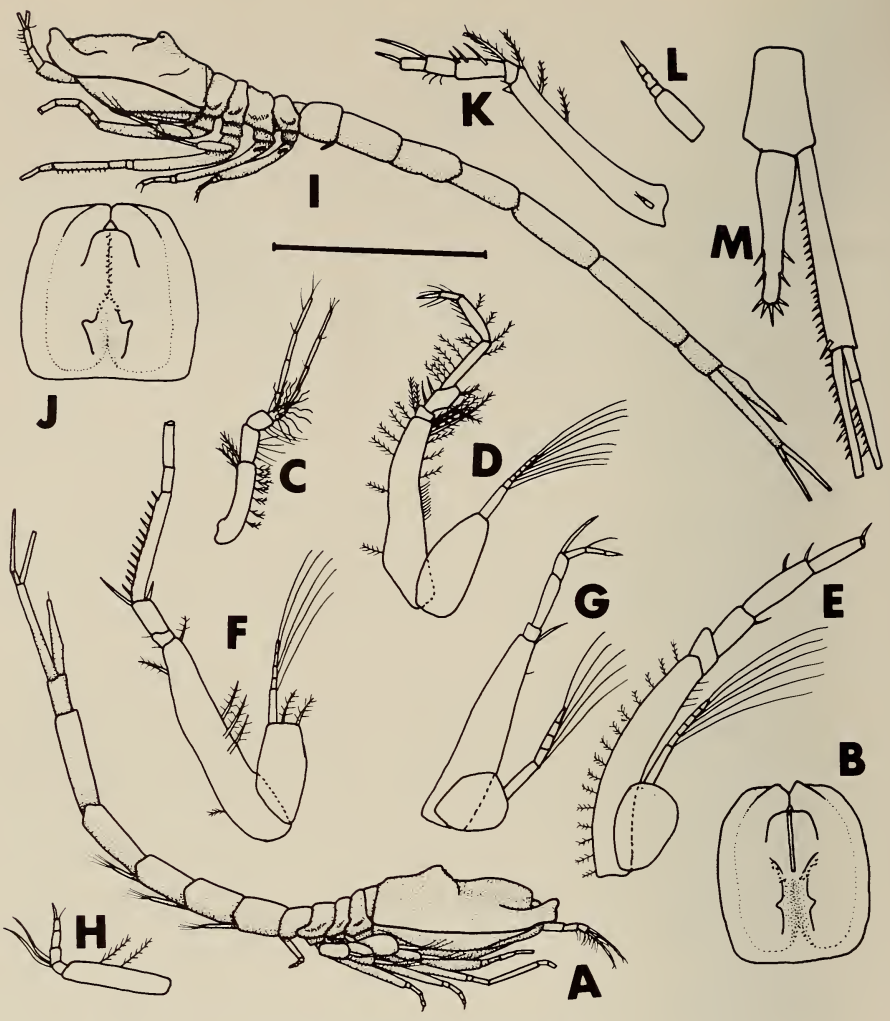

Fig. 4. *Paralamprops peringueyi*
Adult male. A. Lateral view. B. Dorsal view of carapace. C. Antenna 1. D. Maxilliped 3. E. Pereiopod 1. F. Pereiopod 2. G. Pereiopod 3. H. Pereiopod 5.
Adult female. I. Lateral view. J. Dorsal view of carapace. K. Pereiopod 3. L. Pereiopod 5. M. Uropod and telson.
Scale line = 4 mm for A–B, I–J; 2 mm for C–H, K, M; 0,5 mm for L.

merus together, armed with a row of sharp spines. Dactyl incomplete. Exopod large.

Pereiopods 3 (Fig. 4G) and 4 similar, basis very large in comparison with rest of limb, of which merus is longest.

Pereiopod 5 (Fig. 4H) very small, 6-segmented. All segments distal to basis subequal in length. Entire limb less than half length of basis of pereiopod 4.

Three pairs of pleopods present.

Uropods and telson as in female (Fig. 4M) except that telson has three pairs of lateral spines, not two.

Adult female, length 16,0 mm (SAM–A10602). As male, except as follows: posterodorsal elevations of carapace narrower and curling over laterally (Fig. 4I). Middorsal carina much less well developed, minutely denticulate. Carapace almost as wide as long (Fig. 4J). First pedigerous somite visible laterally as well as dorsally.

Antenna 1 with third segment slightly longer, first segment of flagellum without aesthetascs. Second antenna 4-segmented. Exopod of pereiopod 2 smaller. Basis of pereiopods 3 (Fig. 4K) and 4 relatively smaller, distal segments larger and stouter; exopods minute. Pereiopods 5 (Fig. 4L) minute, 5-segmented, with a stout terminal spine.

Telsonic somite (Fig. 4M) nearly twice as long as broad, two-thirds length of telson. Telson with two pairs of lateral spines and five terminally. Peduncle of uropod slightly longer than telson with numerous small spines on inner edge. Rami of uropods incomplete.

Remarks

The adult male has not previously been described but corresponds well with the female in most respects. The female differs slightly from that described by Stebbing (1912), mainly because his was considerably smaller and less mature. In particular the carapace is square, not rounded, in dorsal view and the carpus and propodus of maxilliped 3 are smaller in the present specimens. The exopods of the thoracic limbs of Stebbing's male are smaller, again because it is immature. Nevertheless these characters are of little specific significance and there is no doubt that all individuals belong to the same species. It should be noted that there is some individual variation in the degree to which the median part of the carapace is elevated, particularly in some of the younger individuals.

P. peringueyi is characterized by the very great reduction of the fifth pereiopod, particularly in the female. It is most similar to *P. grimaldi*, from which it may be distinguished by this character.

Distribution

Only known off the Cape Peninsula from about 369 to 1 394 m.

Paralamprops margidens sp. nov.

Fig. 5

Records

SAM–A595 (PF 15785)	34°39′S 18°10′E	500 m	1 ♀: 6,1 mm
SAM–A10602 (PF 17440)	34°25′S 17°45′E	800 m	2 ♀♀: 6,1 mm (holotype + 1); 3 ♂♂: 5,8–6,1 mm

Holotype

Young female, in the South African Museum, SAM–A15721, collected by the S.S. *Pieter Faure* in about 1900. Type locality: 800 m, off the Cape Peninsula (34°25′S 17°45′E).

Description

Young female, *holotype*, length 6,1 mm. Integument lightly calcified, reticulate on body and very slightly denticulate on some limbs. Carapace (Fig. 5A) slightly wider than deep, nearly twice as long as deep, somewhat depressed immediately behind eyelobe. Marginal carina strongly dentate. Middorsal carina shallow, serrate anteriorly. Branchial regions somewhat inflated. No anterolateral angle (Fig. 5B). Pseudorostral lobes short in dorsal view (Fig. 5C). Eyelobe triangular, eyeless.

First three pedigerous somites denticulate laterally. Abdominal somites subcylindrical. Cephalothorax subequal in length to abdomen.

Antenna 1 as in male (Fig. 5N), but third segment slightly longer and flagellum 4-segmented. Accessory flagellum damaged in all females.

Antenna 2 (Fig. 5D) of moderate size, 4-segmented, with the last two segments relatively long.

Maxilla 1 (Fig. 5E) with no sign of palp.

Maxilliped 3 (Fig. 5F) leg-like, basis subequal in length to rest of limb. Ischium small, merus slightly expanded on outer edge with two large terminal spines. Carpus inserting subterminally on merus, subequal in length to last two segments together. Exopod well developed.

Pereiopod 1 (Fig. 5G) very long, basis half length of rest of limb. Merus and carpus subequal in length, propodus almost as long as merus and carpus together, dactyl slightly shorter with several terminal spines. Exopod well developed.

Pereiopod 2 (Fig. 5H) long and slender. Basis subequal in length to next four segments together. Carpus stout with six large spines on lower edge. Last two segments slender. Only basal segment of exopod present.

Pereiopods 3 (Fig. 5I) and 4 similar, basis of pereiopod 4 relatively shorter. Basis of pereiopod 3 very slender, more than twice length of rest of limb. Exopod very small, 2-segmented.

Pereiopod 5 (Fig. 5J) hardly more than half length of basis of pereiopod 4.

Telsonic somite (Fig. 5K) wider than long, little more than a third length of telson. Telson tapering evenly from base, armed with five pairs of short spines laterally and three longer ones terminally. Peduncle of uropod slightly longer than telson. Exopod reaching end of second segment of endopod. Endopod 3-segmented, first armed with fine setae on inner edge.

Subadult male, *paratype*, length 6,1 mm. As female, except as follows: carapace (Fig. 5L) somewhat shallower, denticles slightly larger. No depression behind eyelobe. Middorsal serrations (Fig. 5M) larger and extending further back. Third and fourth pedigerous somites denticulate dorsally.

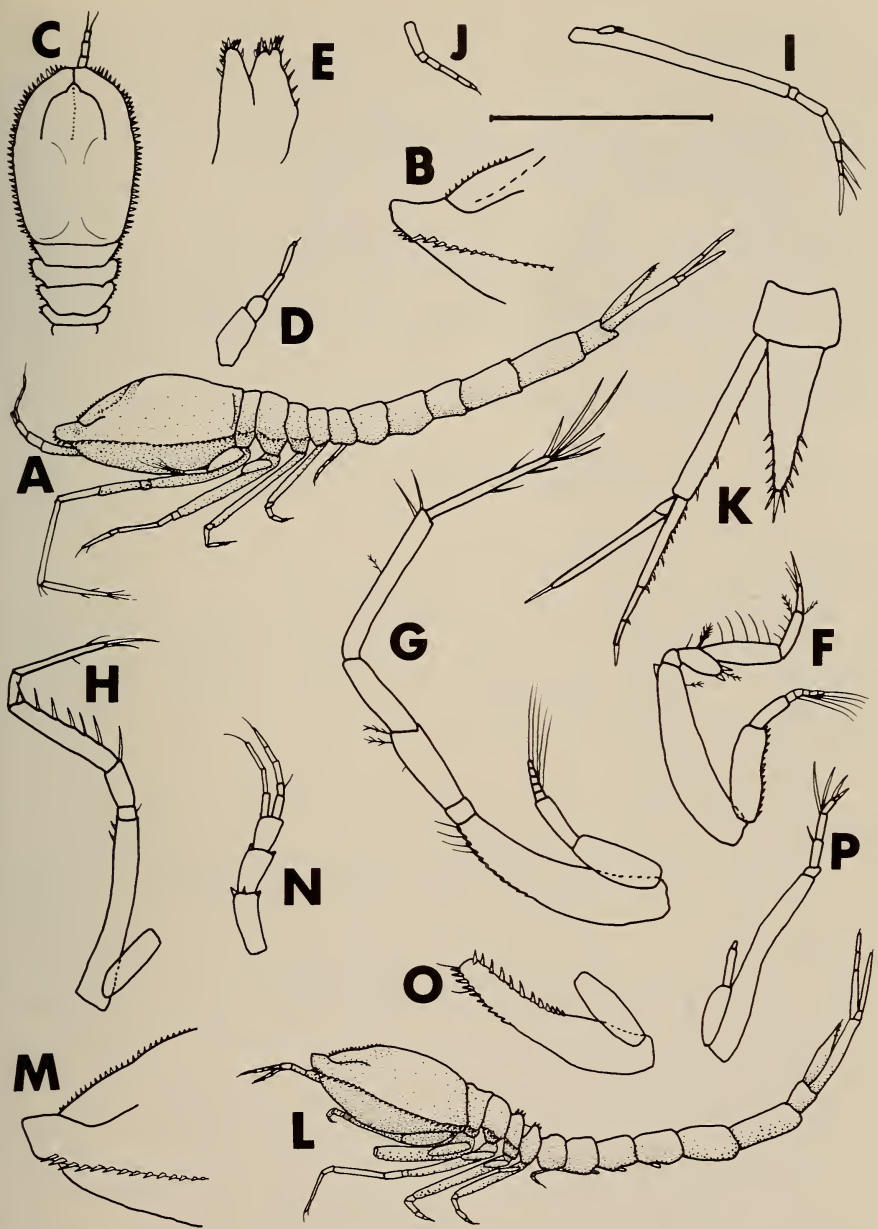

Fig. 5. *Paralamprops margidens* sp. nov.

Adult female, holotype. A. Lateral view. B. Detail of anterior end of carapace. C. Dorsal view of carapace. D. Antenna 2. E. Maxilla 1. F. Maxilliped 3. G. Pereiopod 1. H. Pereiopod 2. I. Pereiopod 3. J. Pereiopod 5. K. Uropod and telson.

Subadult male, paratype. L. Lateral view. M. Detail of anterior end of carapace. N. Antenna 1. O. Basis of pereiopod 1. P. Pereiopod 3.

Scale line = 2 mm for A, C, L; 1 mm for B, F–K, M, O–P; 0,5 mm for D–E, N.

Each segment of antenna 1 (Fig. 5N) slightly longer than succeeding one; flagellum 5-segmented, accessory flagellum 3-segmented. Basis of pereiopod 1 (Fig. 5O) strongly dentate. Distal segments of exopods missing from pereiopods 1 and 2. Bases of pereiopods 3 (Fig. 5P) and 4 shorter and stouter, exopods 3-segmented. Basis of pereiopod 5 slightly longer. Armature of uropods reduced (but possibly lost due to age).

Remarks

Lacking a palp on maxilla 1, *P. margidens* falls within the *serratocostata–aspera–arafurensis* group of *Paralamprops*. It is easily distinguished from these and from the South African *P. peringueyi* by the denticulate marginal carina.

Distribution

Known only from about 500 to 800 m off the Cape Peninsula.

Platysympus Stebbing, 1912

Platyaspis Sars, 1869: 158 (preoccupied name).

Generic diagnosis

Carapace strongly flattened dorsoventrally with strong marginal carina. Both flagella of antenna 1 well developed. Maxilla 1 without palp. Pereiopods 2 to 4 of female without exopods. Male with three pairs of pleopods. Telson well developed.

Type species

Platyaspis typicus Sars, 1869.

Remarks

The genus is well-defined and easily recognizable due to the very characteristic flattened carapace with a strong marginal carina. The absence of exopods on pereiopods 2 to 4 in the female is unique in the family although in other genera they may occasionally be absent from pereiopods 3 and 4. The presence of four new species in southern African waters brings the total number for the genus to seven.

Distribution of Platysympus

Europe from 226 to 1 100 m; North Atlantic from 219 to 957 m; Antarctic at 385 m; South Africa from 188 to 1 200 m.

KEY TO THE SPECIES OF *PLATYSYMPUS*

1 Carapace with three longitudinal ridges dorsal to marginal carina.....
P. tricarinatus Hansen, 1920—N. Atlantic
– Carapace with middorsal and marginal carinae forming only major longitudinal ridges....2
2 Pereiopod 5 half length of pereiopod 4; female with rudimentary exopods on pereiopod 2
*P. brachyurus** Zimmer, 1907—Antarctic
– Pereiopod 5 more than half length of pereiopod 4; pereiopod 2 of female without exopod..3

3 Carapace remarkably flattened and leaf-like: almost circular in dorsal view and wider than abdomen is long.....*P. phylloides*, sp. nov.
– Carapace flattened but not leaf-like: longer than wide in dorsal view and considerably narrower than abdomen is long..... 4
4 Dorsal outline of carapace undulating sinusoidally, forming two evenly-spaced elevations; bases of pereiopods 1 and 2 with flattened, scale-like edges.....*P. camelus* sp. nov.
– Dorsal outline of carapace smooth or with several low, unevenly-distributed tumidities; bases of pereiopods 1 and 2 without flattened, scale-like edges.....5
5 Dorsal third of carapace strongly compressed laterally, forming a very deep middorsal carina; basis of pereiopod 5 less than half length of rest of limb....*P. compressus* sp. nov.
– Dorsal third of carapace not strongly compressed laterally, middorsal carina negligible or incorporating much less than a third of its depth; basis of pereiopod 5 more than half length of rest of limb.....6
6 Middorsal carina distinct over whole length of carapace; carapace of female smooth; merus, carpus and propodus of pereiopod 1 wide and flattened....*P. typicus* (Sars, 1869)—Europe
– Middorsal carina of carapace only evident posteriorly; carapace of female with several tumidities and depressions; merus, carpus and propodus of pereiopod 1 not wide or flattened *P. depressus* sp. nov.

**P. brachyurus* is known only from one incomplete female individual. Some characteristics suggest that when further material is available the species will be found to fit better in *Paralamprops*.

Platysympus phylloides sp. nov.

Fig. 6

Records

SAM–A10607 (PF 16982)	34°40′S 17°50′E	1 200 m	1 adult ♀: 7,2 mm (holotype); 1 damaged ♀
SM 129	30°54′S 30°51′E	850 m	2 ovig. ♀♀: 7,4 and 7,7 mm (both damaged)

Holotype

Adult female, in the South African Museum, SAM–A15682, collected by the *Pieter Faure* in about 1900. Type locality: approximately 1 200 m, off the Cape Peninsula (34°40′S 17°50′E).

Description

Adult female, holotype, length 7,2 mm. Integument very delicate and translucent. Carapace (Fig. 6A) remarkably flat and leaf-like, almost circular in dorsal view (Fig. 6B) with middorsal carina faintly evident anteriorly. Eyelobe small, rounded and eyeless. Carapace flattened and paper-thin at edges forming an almost transparent wide flange extending round entire edge except where attached to abdomen. Posterolaterally, extensions of this carina form flaps overlapping third pedigerous somite on each side and leaving a gap on either side of second somite. All cephalothoracic appendages except fifth pereiopod entirely covered by carapace (Fig. 6C); bases of maxilliped 3 and pereiopod 1 pointing forward and attached underneath carapace by a thin membrane, being thus quite immobilized.

All five pedigerous somites free, last four wider than deep. Carapace wider than abdomen is long. Cephalothorax about half as long again as cylindrical abdomen.

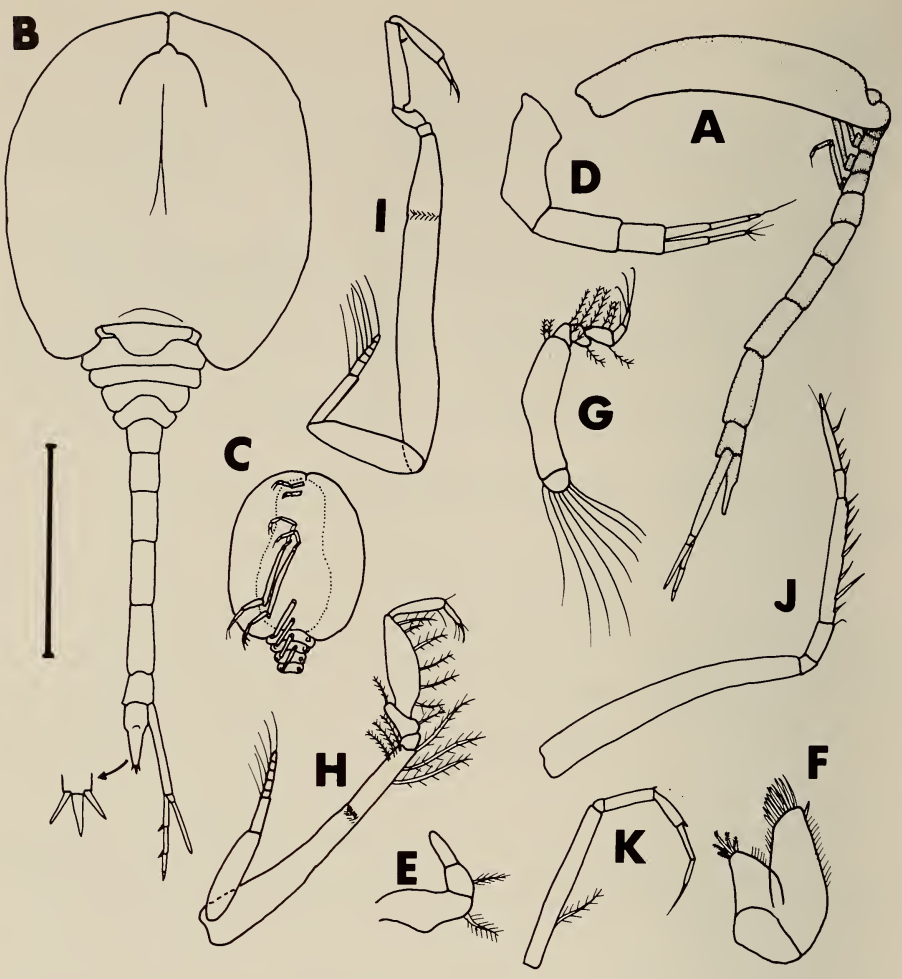

Fig. 6. *Platysympus phylloides* sp. nov.
Adult female, holotype. A. Lateral view. B. Dorsal view. C. Ventral view of cephalothorax. D. Antenna 1. E. Antenna 2. F. Maxilla 1. G. Maxilliped 2. H. Maxilliped 3. I. Pereiopod 1. J. Pereiopod 2. K. Pereiopod 3.
Scale line = 4 mm for C; 2 mm for A–B; 1 mm for G–K; 0,5 mm for D–F.

Antenna 1 (Fig. 6D) small, first segment subequal in length to next two together. Both flagella short but well developed, main flagellum 3- and accessory flagellum 2-segmented.

Antenna 2 (Fig. 6E) reasonably large, 3-segmented.

Maxilla 1 (Fig. 6F) without palp.

Maxilliped 2 (Fig. 6G—from ovigerous female, not holotype) with distal segments short. Oostegal setae long and numerous.

Basis of maxilliped 3 (Fig. 6H) very flexible but immobile, being attached

to the ventral surface of the carapace. Exopod normal but setae very small and poorly setulose. Ischium small; merus slightly expanded; carpus large and stout; propodus and dactyl slender.

Basis and exopod of pereiopod 1 (Fig. 6I) as in maxilliped 3. Ischium small. Carpus elongate, subequal in length to propodus and dactyl together.

Pereiopod 2 (Fig. 6J) lacking exopod. Basis slender, subequal in length to rest of limb. Carpus long and well armed.

Pereiopods 3 (Fig. 6K) to 5 all similar, lacking exopods. Limbs slender, basis subequal in length to rest of limb; merus, carpus and propodus subequal in length.

Telson (Fig. 6B) twice length of telsonic somite, armed with only three small apical spines. Peduncle of uropod subequal in length to last somite and telson together, unarmed. Exopod unarmed, about two-thirds length of endopod. Each segment of endopod armed with a single small spine distally on inner edge.

Males have not been found.

Remarks

In the absence of male individuals it is not possible to state with certainty that this species belongs to *Platysympus*. It is certainly quite distinctive in the nature of the carapace, but apart from this, the appendages are very similar to other members of the genus. It may be that this is merely the ultimate condition in a genus in which the carapace is always flattened, and that the peculiarities of its morphology are necessary to overcome problems associated with a greatly flattened carapace. For example, the exopods, on those limbs which have them, are reduced and it is difficult to see that they would be of any use if they were present. Pleopods would seem to be unimportant as a means of locomotion in such a flattened animal and it may prove that none are present even in the adult male. If this should be so, then the species will have to be placed in a separate genus.

The peculiar attachment of the third maxilliped and first pereiopod to the floor of the carapace is presumably also an adaptation to the overhanging carapace, as is the presence of the inhalent aperture on either side of the second pedigerous somite.

Distribution

Cape Point at 1 200 m and Natal at 850 m.

Platysympus depressus sp. nov.

Fig. 7

Records

SAM–A10602 (PF 17440)	34°25′S 17°45′E	800 m	1 adult ♂: 5,8 mm (holotype); 2 subadult ♂♂: 5,4 mm; 2 young ♂♂: 4,5 mm, 4,8 mm; 3 ovig. ♀♀: 5,8–6,4 mm; 6 ♀♀: 5,1–6,4 mm

SM 86	27°59′S 32°40′E	550 m	1 subadult ♂: 5,4 mm
SM 103	28°31′S 32°34′E	680 m	1 adult ♂: 7,0 mm; 1 damaged ♀
SM 129	30°54′S 30°31′E	850 m	1 young ♂, 2 ♀♀, all damaged
LBT 38J	32°07′S 16°31′E	440 m	1 ♂: 4,8 mm

Holotype

Adult male, in the South African Museum, SAM–A15683, collected by the *Pieter Faure* in about 1900. Type locality: 800 m, off the Cape Peninsula (34°25′S 17°45′E).

Description

Adult male, holotype, length 5,8 mm. Integument fairly thin and translucent without obvious denticles or reticulations. Carapace (Fig. 7A) dorsoventrally depressed with a single marginal carina around entire periphery except posteriorly. Dorsal outline low and smoothly arched. Middorsal carina faintly evident posteriorly only (Fig. 7B). Eyelobe small, eyeless. Pseudorostral lobes short and expanded laterally.

All five pedigerous somites visible, first four slightly flanged laterally. Abdominal somites cylindrical, together slightly shorter than cephalothorax.

Antenna 1 (Fig. 7C) fairly large. Flagellum 4-segmented, first bearing numerous short aesthetascs. Accessory flagellum 3-segmented.

Antenna 2 (Fig. 7D) fairly short, reaching beyond posterior edge of carapace. Segments short and poorly setose.

Maxilla 1 without palp.

Maxilliped 3 (Fig. 7E) fairly short. Basis unexpanded distally, subequal in length to rest of limb. Merus slightly expanded, carpus large. Propodus and dactyl slender.

Basis of pereiopod 1 (Fig. 7F) longer than rest of limb. Ischium as wide as long, next three segments subequal in length.

Pereiopod 2 (Fig. 7G) slender, carpus longer than propodus and dactyl together, armed with four stout spines.

Pereiopods 3 (Fig. 7H) and 4 similar. Basis slightly shorter than rest of limb in pereiopod 3 and slightly longer in pereiopod 4. Exopods present. Distal segments of pereiopod 5 missing.

Three pairs of normal pleopods present.

Uropods and telson as in female: parts of uropods missing from holotype.

Adult female, paratype, length 6.4 mm. As male, except as follows: carapace (Fig. 7J) with a number of slight swellings and depressions, slightly more elevated dorsally; middorsal carina better defined. No wider anteriorly than posteriorly in dorsal view. First pedigerous somite wider and third narrower.

Distal segments of flagella of antenna 1 missing. Antenna 2 (Fig. 7K) 4-segmented. Distal segments of pereiopod 1 flatter and wider. Pereiopods 2 to 4 without exopods. Pereiopod 2 much more slender, carpus longer; bases of pereiopods 3 and 4 longer and slightly thinner. Pereiopod 5 (Fig. 7I) very

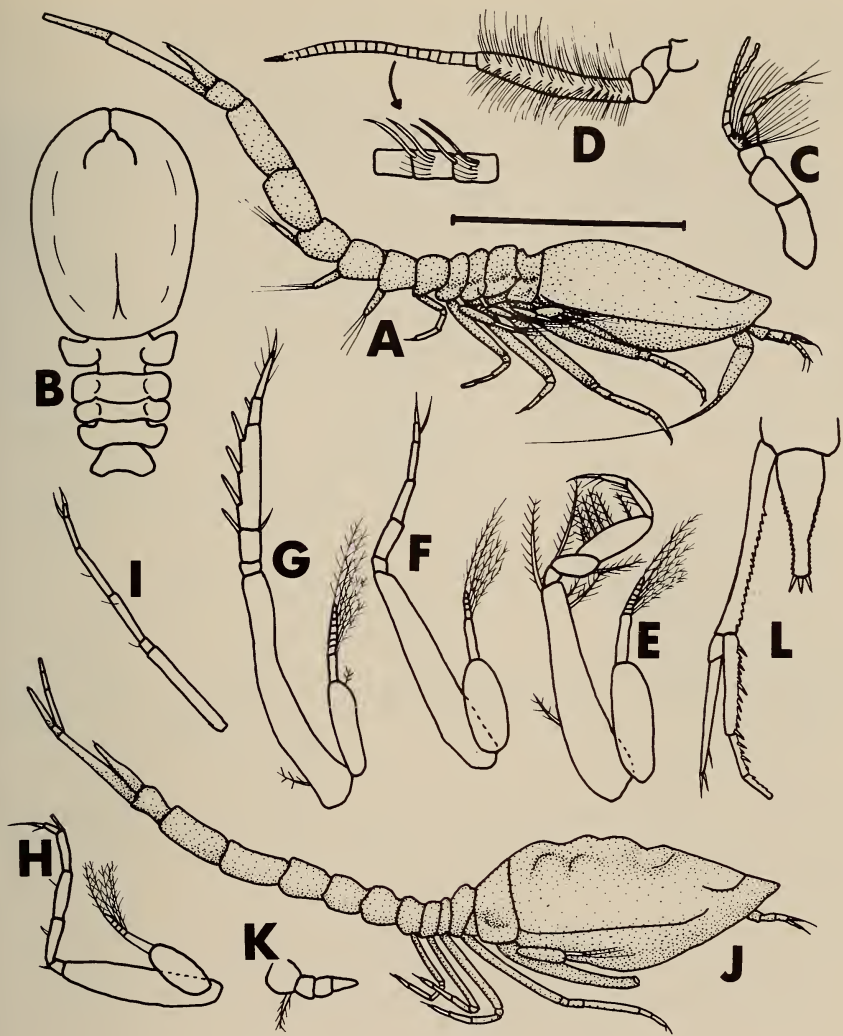

Fig. 7. *Platysympus depressus* sp. nov.
Adult male, holotype. A. Lateral view. B. Dorsal view of carapace. C. Antenna 1. D. Antenna 2. E. Maxilliped 3. F. Pereiopod 1. G. Pereiopod 2. H. Pereiopod 3. I. Pereiopod 5. Adult female, paratype. J. Lateral view. K. Antenna 2. L. Uropod and telson. Scale line = 2 mm for A–B, J; 1 mm for C–I, K–L.

slender, basis equal in length to next three segments together; merus and carpus subequal in length.

Telson (Fig. 7L) nearly twice length of preceding somite, wider proximally than distally and serrated on edges; armed only with three small spines apically. Peduncle of uropod longer than telson, subequal in length to endopod, serrated

on inner edge. Second segment of exopod with three slender distal spines. First segment of endopod longer than next two together.

Remarks

P. depressus is most similar to *P. typicus* (Sars, 1869) and *P. compressus* sp. nov. It may be distinguished from both in that it lacks a middorsal carina on the carapace and from *P. compressus* by the latter being laterally rather than dorsoventrally compressed, lacking low protuberances on the carapace of the female and having a larger first antenna in the male. *P. depressus* differs from *P. typicus* mainly in the shape of the carapace: the dorsal and marginal carinae are better defined and the female lacks low protuberances on the carapace in *P. typicus*. Also in this species the first antennae are smaller, the distal segments of pereiopod 1 are flattened and the second pereiopod is more slender with a longer dactyl.

Distribution

From Lambert's Bay to northern Natal at depths from 440 to 850 m.

Platysympus compressus sp. nov.

Fig. 8

Records

SAM–A10601 (PF 12605)	30°33′S 30°58′E	805 m	1 subadult ♂: 4,8 mm
SM 60	27°09′S 32°58′E	800 m	1 adult ♂: 5,5 mm (holotype); 3 ♂♂: 5,8–6,1 mm; 3 ovig. ♀♀: 5,8–6,1 mm

Holotype

Adult male, in the South African Museum, SAM–A15681, collected by the *Meiring Naude*, 19 May 1976. Type locality: 800 m, off northern Natal (27°09′S 32°50′E).

Description

Adult male, holotype, length 5,5 mm. Integument smooth without reticulations or denticles. Carapace (Fig. 8A) smooth with marginal carina as in *P. depressus*, dorsoventrally depressed for the most part but the dorsal third strongly compressed laterally, forming a very distinct, narrow middorsal carina. Pseudorostral lobes narrowed anteriorly in lateral view, rounded and fairly short in dorsal view (Fig. 8B). Eyelobe small, rounded and eyeless.

All pedigerous somites exposed, all of similar length. Abdominal somites subcylindrical, together shorter than cephalothorax.

Antenna 1 (Fig. 8C) large, first two segments slightly serrated. Second segment much wider distally than proximally, wider than long. Third segment short and subconical. Accessory flagellum missing. First segment of flagellum with numerous short aesthetascs, last three short and subequal in length.

Maxilla 1 without palp. Maxilliped 3 and pereiopods 1 and 2 represented by bases only.

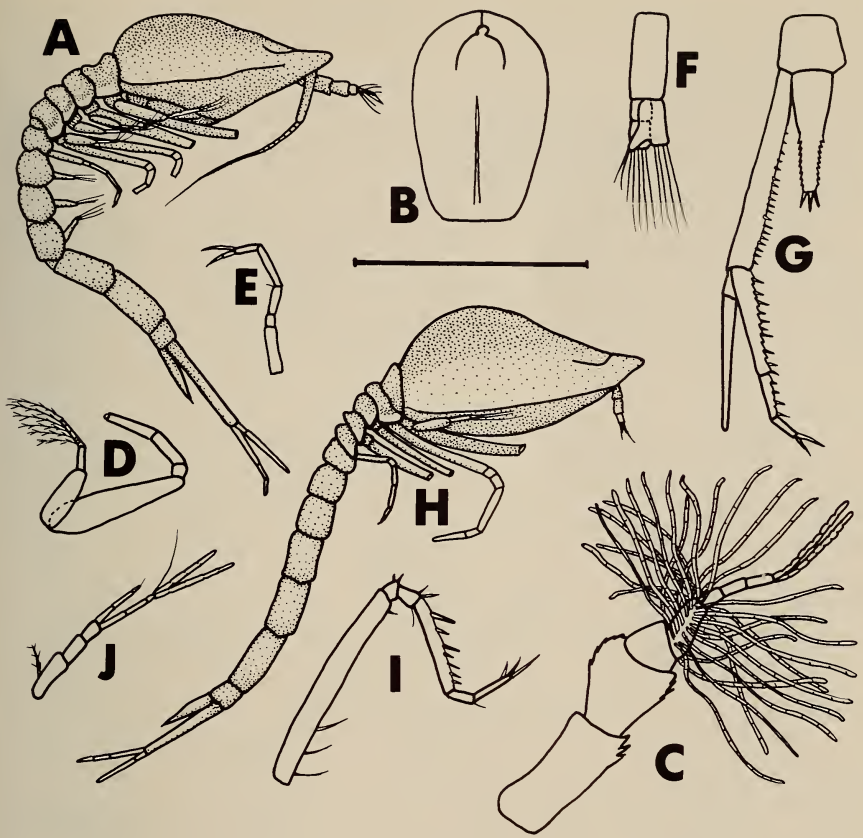

Fig. 8. *Platysympus compressus* sp. nov.
Adult male, holotype. A. Lateral view. B. Dorsal view of carapace. C. Antenna 1. D. Pereiopod 3. E. Pereiopod 5. F. Pleopod 2. G. Uropod and telson.
Ovigerous female, paratype. H. Lateral view. I. Pereiopod 2. J. Antenna 1.
Scale line = 2 mm for A–B, H; 1 mm for D–E, G, I–J; 0,5 mm for C, F.

Pereiopods 3 (Fig. 8D) and 4 similar, last two segments of each missing. Basis stout, ischium short, merus and carpus subequal in length. Exopods moderately large.

Pereiopod 5 (Fig. 8E) short and slender.

Three pairs of pleopods present. (Fig. 8F)

Last abdominal somite as wide as long, less than half length of preceding one. Telson (Fig. 8G) slightly more than half length of peduncle of uropod, serrated distally on lateral edges and with three small sharp spines apically. Peduncle of uropod fairly stout, subequal in length to endopod with numerous small sharp spines distally on inner edge. Exopod slightly longer than first

two segments of endopod, unarmed. First segment of endopod longer than next two together with several small spines on inner edge. Second segment longer than third.

Ovigerous female, paratype, length 6,1 mm. As male, except as follows: carapace (Fig. 8H) slightly deeper, pseudorostral lobes less narrowed in lateral v ew. Pedigerous somites shorter, abdominal somites together subequal in length to cephalothorax. Marsupium small.

Antenna 1 small, segments not expanded. Flagella both 2-segmented. Pereiopod 2 slender, without exopod; carpus longer than last two segments together. Segments distal to basis missing from maxilliped 3 and pereiopods 1, 3 and 4. Pereiopods 3 and 4 without exopods. Telson relatively longer—two-thirds as long as peduncle of uropod—but otherwise as in male.

Remarks

Although the appendages of none of the individuals are complete, the carapace is distinctively different from that of the other species in the genus. The lateral compression of the dorsal part of the carapace is characteristic, as is the large, wide first antenna in the male.

Distribution

Known only from depths between 800 and 810 m off northern Natal.

Platysympus camelus sp. nov.

Fig. 9

Records

SM 86	27°59′S 32°40′E	550 m	1 adult ♂: 6,8 mm (holotype); 3 ovig. ♀♀: 6,1–6,8 mm
WCD 450D	34°11′S 18°05′E	188 m	1 subadult ♂: 3,9 mm; 1 ♀: 4,8 mm; 1 damaged ovig. ♀
SST 1K	35°22′S 22°31′E	200 m	1 ♀: 3,9 mm
SST 17N	35°22′S 22°31′E	200 m	1 damaged adult ♂; 1 subadult ♂: 4,1 mm; 4 ♀♀: 4,1 mm

Holotype

Adult male, in the South African Museum, SAM–A15684, collected by the *Meiring Naude*, 22 May 1976. Type locality: 550 m, off northern Natal (27°59′S 32°40′E).

Description

Adult male, holotype, length 6,8 mm. Integument smooth, slightly translucent. Carapace (Fig. 9A) strongly dorsoventrally depressed at edges; slightly compressed laterally in midline forming distinct dorsal carina undulating in lateral view due to two rounded elevations, one middorsally and one posterodorsally. Marginal carina strong, forming a flattened flange around entire carapace except posteriorly. Eyelobe (Fig. 9B) small, rounded and eyeless. All

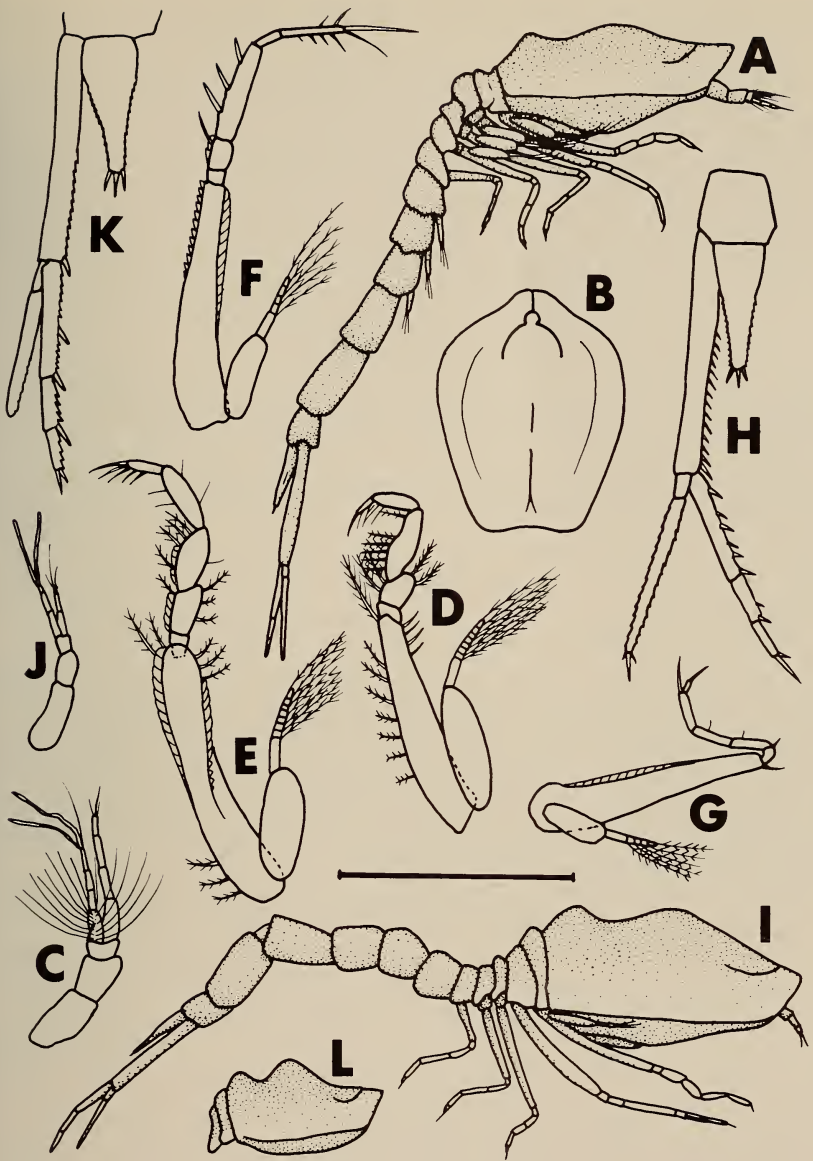

Fig. 9. *Platysympus camelus* sp. nov.

Adult male, holotype. A. Lateral view. B Dorsal view of carapace C. Antenna 1. D. Maxilliped 3. E. Pereiopod 1. F. Pereiopod 2. G. Pereiopod 3. H. Uropod and telson. Ovigerous female, paratype. I. Lateral view. J. Antenna 1. K. Uropod and telson. Juvenile. L. Lateral view of carapace.

Scale line = 2 mm for A–B, I, L; 1 mm for C–H, J–K.

pedigerous somites visible, of approximately equal length. Abdominal somites fairly large, rounded, together subequal in length to cephalothorax.

Antenna 1 (Fig. 9C) fairly large and stout; third segment wider than long. Both flagella 4-segmented, first segment of main flagellum surrounded by numerous short aesthetascs.

Maxilliped 3 (Fig. 9D) short and fairly stout. Basis longer than rest of limb, ischium wider than long. Carpus longer than ischium and merus together.

Bases of pereiopods 1 to 4 flattened, edges expanded by means of flat, transparent scales fusing to form flanges. Basis of pereiopod 1 (Fig. 9E) slightly longer than rest of limb, both inner and outer edges flanged distally. Ischium small, merus and carpus subequal in length, both flanged on inner edge; propodus slightly longer, dactyl short and cylindrical.

Basis of pereiopod 2 (Fig. 9F) flanged distally on both edges. Ischium half length of merus, together about half length of carpus. Propodus and dactyl short and cylindrical.

Pereiopods 3 (Fig. 9G) and 4 similar, inner edges flanged. Basis distinctly longer and stouter than rest of limb, of which merus, carpus and propodus are subequal in length and cylindrical.

Basis of pereiopod 5 about half length of basis of pereiopod 4, distal segments the same.

Three pairs of pleopods present.

Telsonic somite as wide as long, less than half length of telson. Telson (Fig. 9H) tapering evenly from base, little more than half length of peduncle of uropod, serrated distally on both edges and with three small apical spines. Peduncle of uropod with several small sharp spines distally on inner edge. First segment of exopod unarmed, second slightly serrated on both edges with three small terminal spines. First segment of endopod slightly longer than subequal second and third segments together.

Ovigerous female, *paratype*, length 6,8 mm. As male, except as follows: carapace (Fig. 9I) relatively larger, undulations of dorsal surface more marked. Pedigerous somites shorter, the first deeper. Carapace almost round in dorsal view. First segment of antenna 1 (Fig. 9J) larger, third narrower. Both flagella with three segments. Merus of maxilliped 3 longer and thinner, carpus stouter. Distal segments of pereiopod 1 less flattened, edges not flanged, together slightly longer relative to basis. Pereiopods 2 to 4 without exopods. Basis of pereiopod 2 more slender, remaining segments longer and thinner. Bases of pereiopods 3 and 4 more slender. Uropod slightly shorter and stouter, inner edges of peduncle and rami serrated and with fewer spines.

Remarks

The peculiar flanged edges of the bases of pereiopods 1 to 4 and the undulating dorsal edge of the carapace clearly distinguish this species from the others in the genus. It should be noted that this undulation is most marked in juveniles

(Fig. 9L) and least evident in adult males, although these are none the less easy to distinguish.

The flanges on the pereiopods are occasionally found in members of other families of Cumacea (e.g. *Ceratocuma horridum*, Fig. 16D). The functional significance of this feature is uncertain. It may be to increase the surface area (for digging?) with the smallest possible increase in weight.

Distribution

Northern Natal to the Cape Peninsula at depths from 188 to 550 m.

Bathylamprops Zimmer, 1908

Generic diagnosis

Carapace not flattened. Pseudorostral lobes large and acutely produced. Eye absent. First and third segments of antenna 1 elongate, accessory flagellum minute. Palp of maxilla 1 with two filaments. Pereiopods 3 and 4 of female with small exopods. Male with three pairs of pleopods. Telson large and well developed.

Type species

Bathylamprops calmani, Zimmer, 1908.

Remarks

The genus consists of three closely allied deep-water species, *B. calmani* Zimmer, 1908, and *B. natalensis* Jones, 1969, both of which are known only from the east coast of Africa, and *B. motasi* Băcescu & Muradian, 1976, found off Florida. The genus is clearly recognized by the greater development of the pseudorostrum than is usual in the family, and the large first antenna with the minute accessory flagellum. It undoubtedly has close links with *Hemilamprops*, which it resembles in general morphology.

Distribution of Bathylamprops

Deep waters between 1 300 and 3 800 m off the east coasts of Africa and the United States.

KEY TO THE SPECIES OF *BATHYLAMPROPS*

1 Telson more than three times length of telsonic somite; carapace with numerous low, denticulate transverse ridges.....*B. calmani* Zimmer, 1908—east and south-east Africa
– Telson no more than two and a half times length of telsonic somite; carapace minutely denticulate or smooth but without ridges.....2
2 Basis of maxilliped 3 twice length of remaining segments together, carpus no wider than merus; exopod of uropod shorter than telson; uropodal rami subequal in length.....
B. natalensis Jones, 1969—Natal
– Basis of maxilliped 3 little longer than remaining segments together, carpus much wider than merus; exopod of uropod longer than telson and longer than endopod.....
B. motasi Băcescu & Muradian, 1976—Florida

Bathylamprops calmani Zimmer, 1908

Fig. 10

B. calmani Zimmer, 1908: 173–175, figs 60–70.

Records

SM 109	28°41′S 32°36′E	1 300 m	1 adult ♀: 15,4 mm

Previous records

Off Dar-es-Salaam, 2 959 m (Zimmer 1908); off Durban, 2 720–3 530 m (Jones 1969).

Holotype

Damaged adult female, deposited by Zimmer in the Berlin Zoologisches Museum. Type locality: 2 959 m, off Dar-es-Salaam (6°12′S 41°17′E).

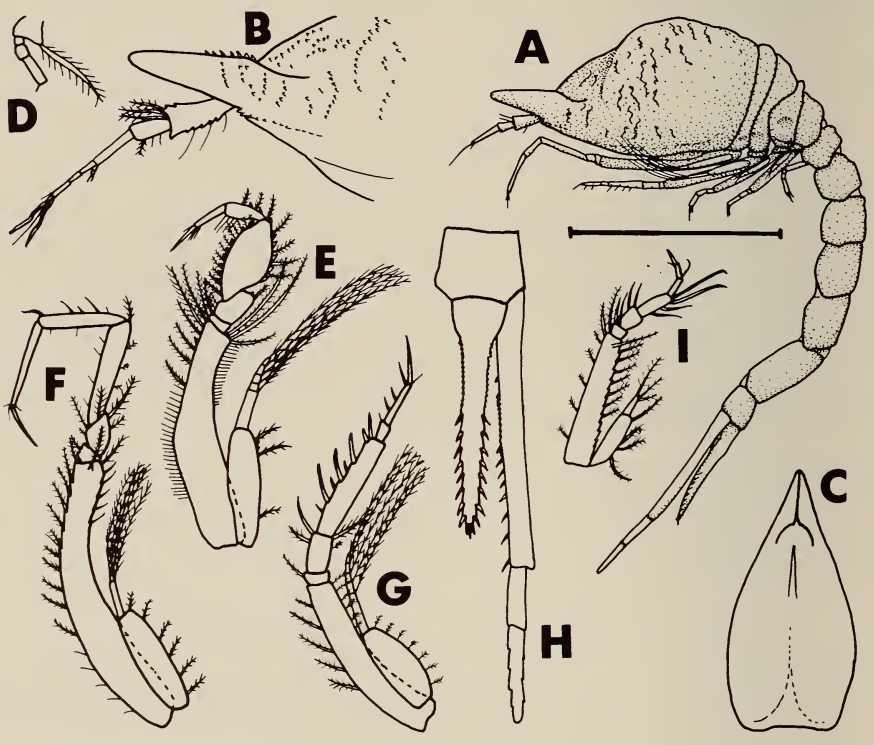

Fig. 10. *Bathylamprops calmani*

Adult female. A. Lateral view. B. Detail of anterior end of carapace. C. Dorsal view of carapace. D. Antenna 2. E. Maxilliped 3. F. Pereiopod 1. G. Pereiopod 2. H. Telson and uropod. I. Pereiopod 4.

Scale line = 4 mm for A–B; 2 mm for C–I.

Description

Adult female, length 15,4 mm. Carapace (Fig. 10A) large, strongly vaulted posteriorly and pointed anteriorly. Integument of carapace minutely denticulate (Fig. 10B) forming numerous transverse ridges, particularly anteriorly. Pseudorostral lobes elongate, denticulate immediately in front of eyelobe; denticles also forming an indistinct and very short lateral carina behind the small and indistinct anterolateral angle. Carapace narrow in dorsal view (Fig. 10C), slightly depressed between a pair of large posterolateral expansions. Middorsal carina present for a short distance behind the eyelobe. Eyelobe very small and eyeless. Pseudorostrum about one-fifth of total length of carapace.

All five pedigerous somites short, visible. Cephalothorax slightly longer than abdomen.

Antenna 1 (Fig. 10B) elongate, first segment more than twice length of second, third slightly longer than second. Accessory flagellum minute, 2-segmented. Flagellum elongate, 3-segmented.

Antenna 2 (Fig. 10D) short, 4-segmented. First segment stout, second and third small, fourth elongate (distal tip missing).

Maxilliped 3 (Fig. 10E) very stout. Basis slightly longer than rest of limb; ischium much wider than long; merus short and slightly expanded; carpus very large and expanded; propodus and dactyl small and cylindrical.

Pereiopod 1 (Fig. 10F) elongate, basis longer than rest of limb. Ischium small, merus slightly longer. Carpus, propodus and dactyl cylindrical and elongate.

Pereiopod 2 (Fig. 10G) stout, basis shorter than rest of limb. Ischium small; carpus long with several strong spines; propodus and dactyl small, narrow.

Pereiopods 3 (Fig. 10I) and 4 similar, basis and exopod of pereiopod 4 shorter. Exopod very well developed for a female, 2-segmented.

Pereiopod 5 shorter and more slender than pereiopod 4.

Telsonic somite (Fig. 10H) slightly wider than long. Telson well developed, more than three times as long as telsonic somite; pre-anal part short, distinctly wider proximally; eight pairs of sharp spines distally on lateral edges and three short ones terminally. Peduncle of uropod slightly longer than telson with several small spines on inner edge. Exopod missing. First two segments of endopod present, first unarmed, second very slightly serrated on both edges.

Adult males are unknown.

Remarks

From the shape of maxilliped 3 and the sculpturing of the carapace it is clear that the present specimen belongs to the same species as Zimmer's. However he figures the pseudorostrum of his unique, damaged specimen as being somewhat shorter than that figured here. It is difficult to say if his was distorted due to mutilation or whether the length is variable.

B. calmani is very similar to both *B. natalensis* and *B. motasi*. However,

in both of the latter the carapace lacks transverse rows of denticles, the exopods of pereiopods 3 and 4 are much smaller and the telson is shorter. In *B. natalensis*, too, the carpus of maxilliped 3 is not expanded and the fifth pereiopod is larger.

Distribution

Confined to deep waters off the east coast of Africa from northern Natal to Dar-es-Salaam at depths from 1 300 to 3 530 m.

Hemilamprops Sars, 1883

Generic diagnosis

Carapace not strongly dorsoventrally flattened. Eye present or absent. Pseudorostrum short. Flagella of antenna 1 well developed. Palp of maxilla 1 with two filaments. Exopods on pereiopods 3 and 4 of female rudimentary. Male with three pairs of pleopods. Telson well developed.

Type species

Not designated: Sars included *H. rosea* (Norman, 1863), *H. cristata* (Sars, 1870), *H. uniplicata* (Sars, 1872) and *H. assimilis* Sars, 1883, in his first description of the genus in 1883.

Remarks

Hemilamprops Sars, 1883, *Mesolamprops*, Given, 1964, and *Lamprops* Sars, 1863, are very closely-related genera, differing mainly in the number of pairs of pleopods in the adult male: none in *Lamprops*, two pairs in *Mesolamprops* and three pairs in *Hemilamprops*. This is the only character which invariably separates the species of the three genera but there are some other differences which are usually reliable in distinguishing them. For example, there is a small but usually distinct antennal notch in *Lamprops*; it may be present or absent in *Mesolamprops* and is usually absent in *Hemilamprops*. An eye is present in *Lamprops*, variable in *Mesolamprops* and usually absent from *Hemilamprops*. The proportions of the basis of pereiopod 1 to the rest of the limb are perhaps most reliable. In *Lamprops* the basis is approximately equal in length to the rest; in *Mesolamprops* it is slightly shorter and in *Hemilamprops* it is distinctly shorter. Although this character appears to be constant, it is not always of practical value since the distal segments of the pereiopods are frequently lost or damaged, particularly in deep-water forms. However the combination of the characters mentioned above should allow most individuals to be placed in the correct genus. But it should be stressed that *only* the number of pleopods in the male is genuinely diagnostic.

Distribution

The genus consists of 22 species, widespread in the Arctic, Antarctic, Pacific, Atlantic and Southern Indian Oceans. The depth distribution is also wide, from 8 to 2 725 m.

The species occur in three distinct groups geographically: one group of eight species is found in the North Pacific, another of five species in the North

Atlantic and Arctic and the remaining group of eight species in southern oceans. Three species (two of which are new) in the last group are found in southern African waters.

There are no records for tropical or subtropical waters and no species is found both north and south of the tropics.

KEY TO THE SPECIES OF *HEMILAMPROPS* FROM THE SOUTHERN HEMISPHERE

Since the tropics form a very distinct boundary between Northern and Southern hemisphere species, a key is given only to those species occurring south of 30°S.

1 Carapace somewhat carinate ventrolaterally, more than one and a half times as broad as deep.....*H. lata* Hale, 1946—Australia
– Carapace not carinate ventrolaterally, less than one and a half times as broad as deep....2
2 Telson longer than peduncle of uropod; carapace robust, subtruncate anteriorly; pseudorostral lobes not meeting anterior to eyelobe.....*H. diversa* Hale, 1946—Australia
– Telson shorter than peduncle of uropod; carapace delicate and elongate; pseudorostral lobes meeting for some distance anterior to eyelobe.....3
3 Telson with ten to twelve pairs of lateral spines; middorsal carina of female finely serrate; carpus of pereiopod 2 long and slender, distinctly more than half length of basis; pseudorostrum pointed anteriorly in lateral view....*H. pellucidus* Zimmer, 1908—Southern Ocean
– Telson with no more than six pairs of lateral spines; middorsal carina and pseudorostrum variable; carpus of pereiopod 2 less than half length of basis.....4
4 Anterior tip of pseudorostrum slightly uptilted; anterolateral edge and middorsal carina bearing long, slender spines; telson less than half length of peduncle of uropod with five pairs of small spines laterally and three long ones terminally.....*H.* sp.—South Africa
– Anterior tip of pseudorostrum not uptilted; carapace without spines middorsally or laterally (may be denticulate); telson as long or almost as long as peduncle or uropod with zero to six pairs of spines laterally and three to five terminally.....5
5 Telson with five long spines terminally and none laterally; carapace fairly broad and truncate anteriorly in dorsal view; basis of maxilliped 3 widely expanded, carpus very large and expanded .....*H. glabrus* sp. nov.
– Telson with three long spines terminally and one to six pairs laterally; carapace fairly slender and pointed anteriorly in dorsal view; neither basis nor carpus of maxilliped 3 much expanded 6
6 Peduncle of uropod subequal in length to endopod....*H. lotusae* Băcescu, 1969—Argentine
– Peduncle of uropod subequal in length to exopod..... 7
7 Telson with six pairs of lateral spines; carapace finely denticulate middorsally.....
H. serrulata Ledoyer, 1977—Kerguelen
– Telson with three pairs of lateral spines; carapace smooth middorsally.....
H. ultimaspei Zimmer, 1921—Tierra del Fuego

Hemilamprops pellucidus Zimmer, 1908

Figs 11–12

H. pellucidus Zimmer, 1908: 172–173, figs 53–59; 1913: 456–457. Stebbing 1912: 144–145, pl. 52. Jones 1963: 52–53, figs 192–201; Jones 1969: 119.

Records

SAM–A594 (PF 17386)		34°27′S 17°42′E	849 m	1 subadult ♂: 7,4 mm; 1 ♀: 8,0 mm
SAM–A595	(PF 15785)	34°39′S 18°10′E	500 m	4 subadult ♂♂: 5,8–8,0 mm; 4 ovig. ♀♀: 8,3–8,6 mm; 9 ♀♀: 6,1–9,0 mm

SAM–A10601 (PF 12605)	30°33′S 30°58′E	805 m	1 subadult ♂: 6,8 mm
SAM–A10602 (PF 17440)	34°25′S 17°45′E	800 m	2 subadult ♂♂: 7,0–8,0 mm; 1 ♂: 6,9 mm; 2 ovig. ♀♀: 8,6–9,9 mm; 1 juv. 4,6 mm
SM 60	27°09′S 32°58′E	800 m	1 adult ♂: 7,8 mm; 2 subadult ♂♂: 5,8–7,0 mm; 3 ♀♀: 6,4–9,6 mm
SM 69	27°12′S 32°56′E	660 m	1 damaged ♂
SM 86	27°59′S 32°40′E	550 m	6 adult ♂♂: 7,4–8,6 mm; 6 subadult ♂♂: 6,1–7,7 mm; 5 ♂♂: 5,8–6,4 mm; 5 ovig. ♀♀: 9,0–11,2 mm; 5 ♀♀: 5,4–8,3 mm; 5 juvs: 3,8–5,4 mm
SM 109	28°41′S 32°36′E	1 300 m	1 subadult ♂: 7,4 mm; 1 ♀: 7,4 mm
SM 129	30°53′S 30°31′E	850 m	1 damaged ♂; 2 ovig. ♀♀: 9,0–9,3 mm
SST 17P	35°22′S 22°31′E	200 m	1 ♀: 6,4 mm
LBT 67A	32°04′S 17°12′E	200 m	1 subadult ♂: 6,7 mm; 3 ♀♀: 5,8–7,0 mm
LBT 70C	32°07′S 17°12′E	330 m	1 juv.: 5,1 mm
LBT 72D	32°07′S 17°31′E	400 m	3 subadult ♂♂: 5,8–7,7 mm

Previous records

Agulhas Bank, 126 to 596 m (Zimmer 1908, 1921); Chatham Rise, 238 to 535 m (Jones 1963); Antarctic, 2 725 m (Zimmer 1913); Great Australian Bight, 1 320 to 1 340 m (Jones 1969); off Recife, Brazil, >1 000 m (Jones pers. comm.).

Holotype

Not designated: young male and female syntypes deposited in the Berlin Zoologisches Museum. Type locality: 564 m, on the Agulhas Bank (35°09′S 18°32′E).

Description

Adult male, length 7,4 mm (SM 86). Integument thin, pellucid, finely reticulate. Gut-contents black. Carapace (Fig. 11A) elongate, twice as long as deep. Pseudorostral lobes short, roundly pointed anteriorly. Antennal notch a slight excavation below pseudorostrum. Eyelobe (Fig. 11B) small, pointed, with several small denticles in midline. Carapace swollen posteriorly on either side of shallow middorsal depression. Middorsal carina evident anteriorly, denticulate only on eyelobe. Carapace less than half length of rest of body. Pedigerous somites all visible, not flanged laterally. Abdominal somites cylindrical.

First segment of antenna 1 (Fig. 11C) longer than next two together. Flagellum 4-segmented with several small aesthetascs at base; accessory flagellum 3-segmented.

Flagellum of antenna 2 (Fig. 11D) reaching almost to end of body.

Palp of maxilla 1 with two filaments.

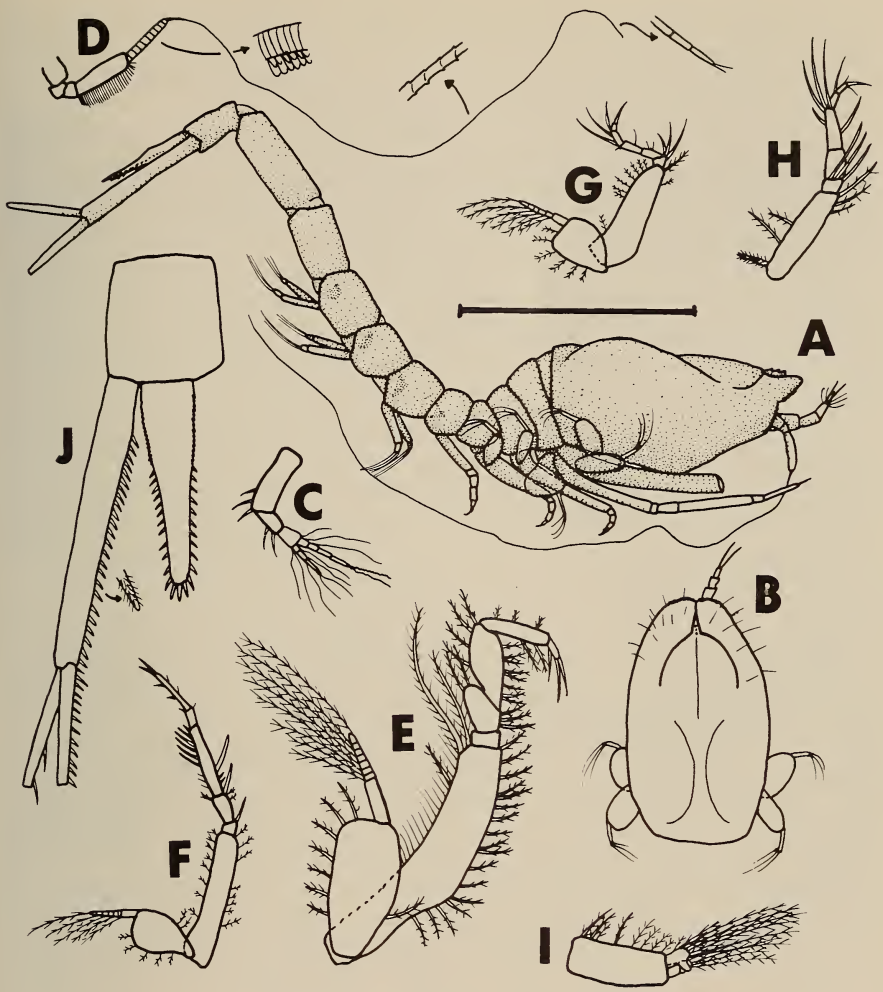

Fig. 11. *Hemilamprops pellucidus*

Adult male. A. Lateral view. B. Dorsal view of carapace. C. Antenna 1. D. Antenna 2. E. Maxilliped 3. F. Pereiopod 2. G. Pereiopod 3. H. Pereiopod 5. I. Pleopod 2. J. Uropod and telson.

Scale line = 4 mm for A–B; 2 mm for C–J.

Basis of maxilliped 3 (Fig. 11E) slightly longer than rest of limb. Carpus stout and slightly expanded. Propodus about twice length of dactyl.

Distal segments of pereiopod 1 missing from all specimens. Exopod large and very well developed.

Basis of pereiopod 2 (Fig. 11F) little more than half length of rest of limb. Carpus elongate with several fine spines. Exopod large and almost circular in outline.

Pereiopods 3 (Fig. 11G) and 4 similar. Basis of pereiopod 3 very large and stout, of pereiopod 4 less so.

Pereiopod 5 (Fig. 11H) shorter, basis subequal in length to rest of limb.

Three pairs of typical pleopods present (Fig. 11I).

Telsonic somite (Fig. 11J) less than half length of preceding somite, about two-thirds length of peduncle of uropod. Pre-anal part of telson less than half of total length, serrated laterally. Post-anal part narrower with ten to twelve pairs of small lateral spines and three terminally.

Peduncle of uropod slender with many fine spines on inner edge. Distal portions of both rami missing from all males.

Adult female, length 11,2 mm (SM 86). As male, except as follows: eyelobe (Fig. 12A) without serrations; middorsal carina very finely serrate. Carapace (Fig. 12B) considerably wider posteriorly than anteriorly.

Antenna 1 (Fig. 12C) smaller, without aesthetascs. Antenna 2 (Fig. 12D) 3-segmented. Maxilliped 3 (Fig. 12E) stouter, carpus relatively longer. Exopods of pereiopods much smaller. Basis of pereiopod 1 (Fig. 12F) strongly serrate, subequal in length to next four segments together; propodus and dactyl long, slender and subequal in length. Basis of pereiopod 2 (Fig. 12G) shorter, carpus

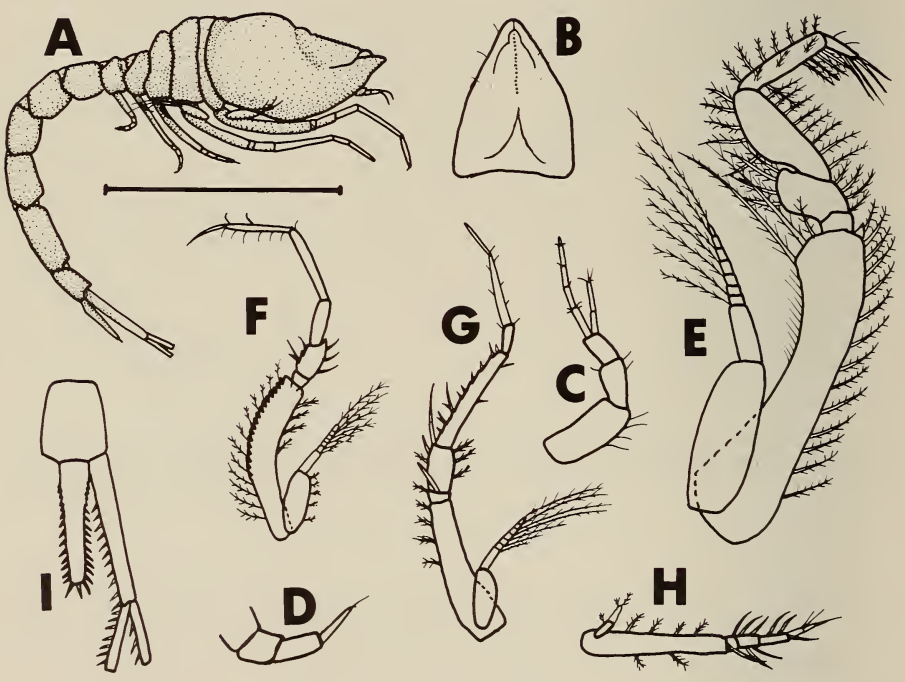

Fig. 12. *Hemilamprops pellucidus*

Adult female. A. Lateral view. B. Dorsal view of carapace. C. Antenna 1. D. Antenna 2. E. Maxilliped 3. F. Pereiopod 1. G. Pereiopod 2. H. Pereiopod 3. I. Uropod and telson. Scale line = 4 mm for A–B; 2 mm for F–I; 1 mm for C–E.

longer. Bases of pereiopods 3 (Fig. 12H) and 4 shorter and more slender; exopods 2-segmented.

Telson (Fig. 12I) slightly longer, peduncle of uropod with fewer spines.

Remarks

This species is readily identifiable by the pellucid nature of the integument, nearly always resulting in the gut being clearly visible: in the present specimens it is black or dark brown. It closely resembles a number of other species in which the carapace is of similar shape, but may be distinguished from them as follows: *H. cristata* (Sars, 1869), *H. glabrus* sp. nov., *H. ultimaespei* Zimmer, 1921, *H. lotusae* Băcescu, 1969, *H. serrulata* Ledoyer, 1977, and *Hemilamprops* sp. all have no more than five pairs of lateral spines on the telson. *H. normani* Bonnier, 1896, has a shorter telson and uropodal peduncle and the middorsal carina is slightly serrated in the male. *H. pellucidus* most closely resembles *H. tanseiana* Gamô, 1967, differing from it in the greater number of lateral spines on the telson, the reduced serrations on the middorsal carina, the longer uropod and telson and the larger and more expanded merus and carpus of maxilliped 3 in *H. pellucidus*.

The individuals figured by Stebbing (1912) and Zimmer (1908) differ in several respects from each other and also from those figured here. The shape of the carapace in subadult males differs slightly, as does the length of the telson and its number of lateral spines. Adult males also have a longer telson and more, but smaller, spines on the peduncle of the uropod in the present specimens. Other differences can be attributed to varying age and sex. The adult female differs from that figured by Zimmer in the length of the propodus and dactyl of pereiopod 1 and from Stebbing's as well as from Zimmer's in the slightly longer and stouter telson. However, it seems that the specimens from SAM–A594 are the selfsame ones described and figured by Stebbing, and in fact these fit well within the range of variation of the other individuals available for examination. Thus it is clear that the present specimens can be referred to Zimmer's *H. pellucidus* without any great doubt.

Distribution

This is one of the few species of Cumacea which occurs in southern African waters without being endemic. It appears to be widespread throughout the southern oceans at depths from 126 to 2 725 m.

Hemilamprops glabrus sp. nov.

Fig. 13

Records

SM 109	28°41′S 32°36′E	1 300 m	1 ovig. ♀: 7,0 mm (holotype); 2 ♀♀: 6,4–7,2 mm; 2 mancas: 2,9–3,2 mm

Holotype

Ovigerous female, in the South African Museum, SAM–A15680, collected by the *Meiring Naude*, 25 May 1976. Type locality: 1 300 m, off northern Natal (28°41′S 32°36′E).

Description

Ovigerous female, holotype, length 7,0 mm. Integument rather thin and translucent. Carapace (Fig. 13A) fairly short, swollen posteriorly on either side of shallow middorsal depression. Pseudorostral lobes short and truncate anteriorly with an indistinct anterolateral carina running posteriorly for a short distance, bearing a few denticles above. Carapace in dorsal view (Fig. 13B) slightly flattened, distinctly broader than deep. Eyelobe small, rounded and

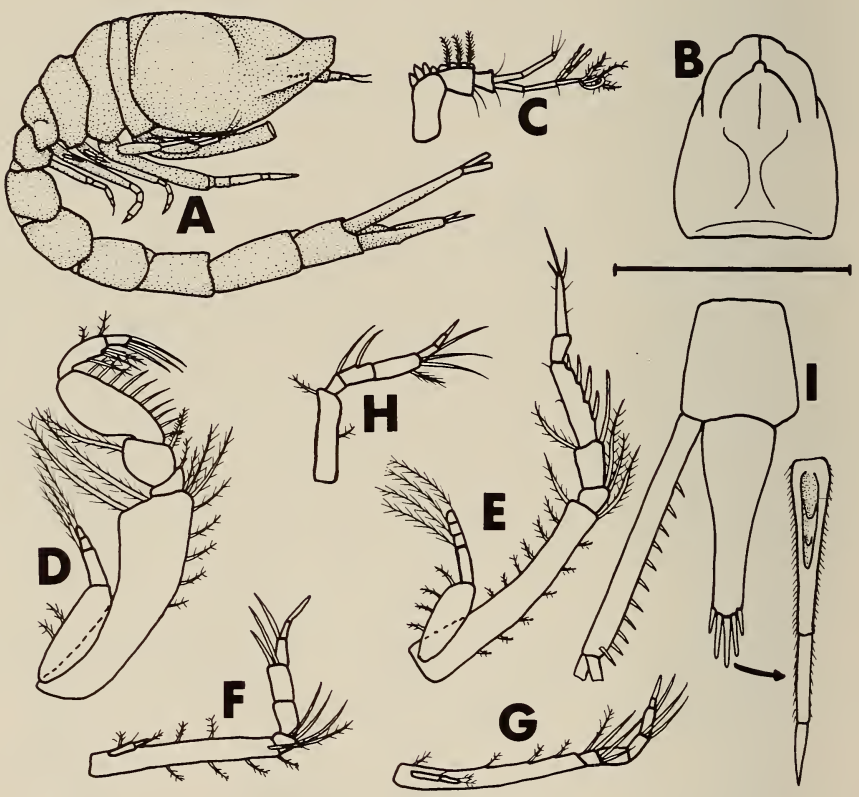

Fig. 13. *Hemilamprops glabrus* sp. nov.

Ovigerous female, holotype. A. Lateral view. B. Dorsal view of carapace. C. Antenna 1. D. Maxilliped 3. E. Pereiopod 2. F. Pereiopod 3. G. Pereiopod 4. H. Pereiopod 5. I. Uropod and telson.

Scale line = 2 mm for A–B; 1 mm for C–I.

eyeless. Pedigerous somites rather deep, all visible. Abdominal somites cylindrical, together subequal in length to cephalothorax. Marsupium small.

Antenna 1 (Fig. 13C) fairly short, both flagella 3-segmented, third segment of accessory flagellum very short.

Palp of maxilla 1 with two filaments.

Basis of maxilliped 3 (Fig. 13D) very stout, slightly shorter than rest of limb: no more than three times as long as wide and particularly expanded distally. Merus wide, carpus large and flattened.

Segments distal to basis missing from pereiopod 1 in all specimens.

Pereiopod 2 (Fig. 13E) slender, basis subequal in length to rest of limb; carpus relatively short, subequal in length to propodus and dactyl together.

Pereiopods 3 (Fig. 13F) and 4 (Fig. 13G) similar. Exopods very small, 2-segmented.

Pereiopod 5 (Fig. 13H) short, basis shorter than rest of limb.

Telsonic somite (Fig. 13I) almost square in dorsal outline, more than half length of telson. Telson slightly shorter than peduncle of uropod, wider proximally; lateral edges entirely smooth; apex with five long stout complex spines. Peduncle of uropod with several small sharp spines on inner edge. Rami missing from all specimens.

Males are not available.

Remarks

It has already been remarked that without mature males it is not possible to place species conclusively in *Lamprops*, *Mesolamprops* or *Hemilamprops*. In this case the first pereiopod cannot be used either since the distal segments are missing in all specimens. However, the general appearance of the specimens, together with their locality, strongly suggests that they should be placed in *Hemilamprops*. In some respects, they do bear a slight resemblance to *Lamprops? comata* Zimmer, 1907 from deep water off Tierra del Fuego, but since this species is known only from a single fragmentary female, no reasonable comparison is possible.

Within *Hemilamprops*, *H. glabrus* is easily distinguished by the short, stout basis of maxilliped 3 and the shape of the carapace. From those species which it most closely resembles it may be distinguished as follows: from *H. pellucidus* Zimmer, 1908, *H. cristata* (Sars, 1869), *H. tanseiana* Gamô, 1967, *H. normani* Bonnier, 1896, *H. serrulata* Ledoyer, 1977, and *Hemilamprops* sp. by the absence in *H. glabrus* of lateral spines on the telson and denticles on the mid-dorsal carina; from *H. ultimaespei* Zimmer, 1921, and *H. lotusae* Băcescu, 1969, in that it has five terminal spines on the telson and none at all laterally and that its carapace is much broader and truncate anteriorly.

Distribution

Known only from the type locality: northern Natal at 1 300 m.

Hemilamprops sp.

Fig. 14

Records

SAM–A10607 (PF 16982)	1 200 m	34°40′S 17°50′E	2 ovig. ♀♀: 9,6–10,2 mm; 1 ♀: 9,1 mm; 1 damaged ♀

Remarks

Although four individuals of this species are available, all of them are too badly damaged to allow an adequate description. Figure 14A is a composite drawing of the undamaged parts of both ovigerous females.

None the less the carapace and telson are quite distinct from those of any other known species. In particular, the denticles anteriorly along the mid-dorsal carina and on the anterolateral margin of the carapace (Figs 14A and 14B) are longer and sharper than those of any known species, while the telson (Fig. 14C) is characteristically short, with the three terminal spines particularly long and slender. In these characters it is unique in the genus, so that it should not prove difficult to identify further specimens as belonging to the same species.

It is tentatively placed in *Hemilamprops* for the same reasons as those given above for *H. glabrus*. However, the same cautionary note must be sounded until adult males are available to confirm its generic position.

Distribution

Known only from a single sample from a depth of 1 200 m off the Cape Peninsula.

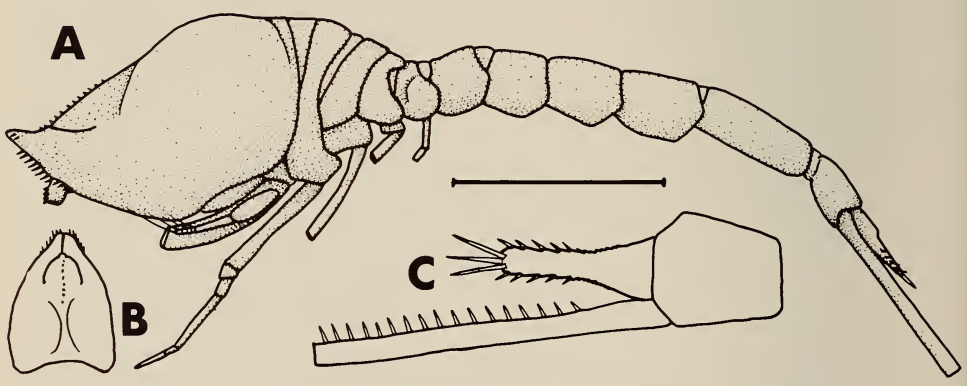

Fig. 14. *Hemilamprops* sp.
Adult female. A. Lateral view. B. Dorsal view of carapace. C. Uropod and telson.
Scale line = 4 mm for B; 2 mm for A; 1 mm for C.

DISTRIBUTION OF LAMPROPIDAE

With only fifty-eight species, the family is rather small, constituting less than 10 per cent of known species of Cumacea. Table 1 details the world-wide distribution of lampropids according to latitude and depth. It can be seen that the family is generally confined to deep and/or cold waters and has a bipolar distribution. 58 per cent of the species-records are from latitudes north of 20°N, 6 per cent between 20°N and 20°S and 36 per cent south of 20°S. Thus very few species are known from the tropics: one of these is recorded from 390 m and the rest from depths greater than 800 m, where temperatures are considerably lower than on the surface. This pattern of distribution shows a direct contrast to that of the Bodotriidae where 38 per cent of the species are found in the tropics (between 20°N and 20°S) (Day 1978).

TABLE 1. Distribution of Lampropidae according to depth and latitude (data mainly from Jones 1969). Species may be entered more than once if they have been recorded from widely different depths or localities. The entry marked * is also entered under '5–200 m' and is, therefore, excluded from the total count of species.

	Shore–5 m		5–200 m		200–2 000 m		> 2 000 m		Total	
	no.	%	no.	%	no.	%	no.	%	no.	%
N of 70°N . . .	1	1+	1	1+	0	0	0	0	2	3
50–70°N . . .	1	1+	12	18	9	13	0	0	22	32
20–50°N . . .			11	16	3	5	2	3	16	23
20°N–20°S . . .			0	0	3	5	1	1+	4	6
20–50°S			3	5	12	18	1	1+	16	24
50–70°S			2	3	0	0	0	0	2	3
S of 70°S . . .			1	1+	2	3	3	5	6	9
Total no. of records	2	3	30	44	29	43+	7	10+	68	100
Total no. of species	1*	1+	26	44	25	42	8	13	59	100

Assuming that the distribution of the lampropids is indeed limited by water temperature, then those species living in shallow water (less than 200 m) would be expected to occur at higher, cooler latitudes. This is shown by the fact that there are no records for shallow waters between 20°N and 20°S, which is not merely a reflection of collecting effort, since 36 per cent of bodotriids are found in the same situation.

Similarly it can be shown that the lampropids preponderate in northern waters, since there are nearly twice as many species (58 %) recorded north of 20°N as there are south of 20°S (36 %). Percentages for the bodotriids are again in inverse proportion to this: 24 per cent occur north of 20°N and 37 per cent south of 20°S.

Fully 55 per cent of lampropids are recorded from depths greater than 200 m (less than 8 % for bodotriids) and 12 per cent below 2 000 m (less than 1 % for bodotriids).

Thus the lampropids form a bipolar group, preferring deep, cold water and avoiding the tropics. Because the collecting effort has been minimal in deep waters, it is suggested that the number of species of lampropid is artificially

low. It is predicted that the number of new species in this family will increase rapidly if more collecting is done in deep waters. This prediction is supported by the fact that in the present paper, of the ten species described, six are new.

Of the eleven genera, four (*Mesolamprops* Given, 1964, from California, *Archaeocuma* Băcescu, 1972, from Peru, *Chalarostylis* Norman, 1879, from the North Atlantic and *Stenotyphlops* Stebbing, 1912, from South Africa) are monotypic and their distribution need concern us no further.

Bathylamprops Zimmer, 1908, consists of three species from deep waters, two off the east coast of Africa and one off Florida, and *Pseudodiastylis* Calman, 1905, of two species from deep tropical waters. The remaining genera together consist of fifty species.

Lamprops Sars, 1863, contains twelve species, all from shallow waters at depths less than 200 m and all from the northern hemisphere. Three of these occur mainly between 20° and 50°N and the rest are found north of 50°N, particularly in the region of the Bering Strait. The possible affinities of *Lamprops? comata* are discussed above. *Lamprops fasciata* is the only species in the family to have been found intertidally.

Hemilamprops Sars, 1883, consisting of twenty-one species, is very widespread, representatives being found from the Arctic to the Antarctic, from the Pacific, Atlantic, Indian and southern oceans at depths from 8 to more than 2 000 m. The species fall into three groups: 8 species occur in the North Pacific (Japan to California), 5 in the North Atlantic and Arctic and 8 around South America, South Africa and Australasia. None occurs between 30°N and 30°S. The genus is bipolar, and follows the distribution pattern shown by the family as a whole.

Platysympus Stebbing, 1912, now consists of 7 species, all from waters deeper than 200 m. 2 species are known from the North Atlantic and Norway, and 5 from the Southern hemisphere—1 from the Antarctic and the 4 new species from South Africa.

Paralamprops Sars, 1887, consists of 10 deep-water species. 3 occur in the North Atlantic from 600–3 789 m, 6 in the southern ocean from South Africa to the Antarctic at 232–3 423 m, and 1 in the East Indies at 390 m.

Many of the species are known only from a single record and since so little collecting has been done in deep water where many species normally occur, it is predictable that the actual distribution of species will prove to be much wider than it appears at present.

DISTRIBUTION OF THE SOUTHERN AFRICAN LAMPROPIDAE

Eleven species of lampropid are now known from these waters. Since they are found only at depths greater than 200 m (with a single exception at 188 m), and very little collecting has been done in deep water off southern Africa, it is difficult and perhaps misleading to distinguish any clear distribution patterns.

The frequency of occurrence is also uncertain, because earlier records are

incomplete and Cumacea are not caught in all samples, sometimes because the substratum is unsuitable (rock or very coarse sand) or simply because cumaceans are scanty for some other unknown reason. There is also the simple fact that no sampling has been done off the west coast north of Lambert's Bay or off Mozambique at depths greater than 200 m. However, of the 12 grabs taken by UCT at these depths around the coast, 6 contained lampropids, as did 7 of the ten SM samples which contained any Cumacea at all. The incompleteness of the early *Pieter Faure* records is such that it is not possible to determine the exact type of collecting gear nor the number of stations. But from the previous two sets of figures it seems that lampropids are not at all uncommon deep-water forms, although they are entirely absent from waters shallower than 188 m.

In this way the South African lampropids differ from the Northern hemisphere species, of which more than 60 per cent are shallow-water forms. This is no doubt due to the fact that shallow waters in southern Africa are relatively warm.

The southern African species do not fall into any obvious groups: temperature conditions in waters deeper than 200 m do not vary much round the coast and there are many stretches of coast which have been sampled poorly or not at all. In fact, there are only five rather small regions in which sampling has been at all comprehensive. These are off Lambert's Bay, the Cape Peninsula, Still Bay, Durban, and in a fairly wide area off northern Natal.

Two species occur throughout the range: *Platysympus depressus* (21 specimens) and *Hemilamprops pellucidus* (79 specimens), which are also the two most common species in most samples. (This indicates, incidentally, that breaks in the ranges of most species are due to a paucity of numbers rather than the realistic limits of very confined ranges.) Two further species occur from the Cape Peninsula to northern Natal: *Stenotyphlops spinulosus* (17 specimens) and *Platysympus camelus* (14 specimens). The other six species, *Paralamprops peringueyi* (14 specimens), *Paralamprops margidens* (6 specimens), *Platysympus phylloides* (4 specimens), *Platysympus compressus* (8 specimens), *Bathylamprops calmani* (1 specimen), *Hemilamprops glabrus* (5 specimens) and *Hemilamprops* sp. (4 specimens) occur in only one or two regions and are therefore of little value in zoogeographic terms. The only one for which there is some little evidence for a really restricted range is *Paralamprops peringueyi* which is not uncommon off the Cape Peninsula (14 specimens in 3 samples) but has not yet been found anywhere else.

Only two of the ten species are known outside South African waters: the type specimen of *Bathylamprops calmani* was found off Dar-es-Salaam, and Jones (1969) has since recorded three specimens off Durban. The type locality is at a depth of 2 959 m and the other depth records are 2 720 and 3 530 m, suggesting that the present specimen from 1 300 m was at about the upper depth limit for the species. *H. pellucidus* is one of the most widespread of southern African Cumacea, occurring in southern oceans from the Chatham Rise, the

Antarctic, Brazil and the Great Australian Bight as well as being by far the most common lampropid in local waters, constituting half of the individuals in the present collection.

Little can be deduced about depth distributions. In some cases there is a slight tendency for individuals to occur in shallower waters off the cold west coast (*P. depressus* at 440 m off Lambert's Bay, and 550 to 680 m off northen Natal; *P. camelus* at 188 m off the Cape Peninsula, and 550 m off northern Natal; *H. pellucidus* at 200 to 400 m off Lambert's Bay, and 550 to 1 300 m off northern Natal). However, collecting on the west coast has generally been in shallower waters than on the east coast so the differences may be more apparant than real.

There is a slight indication of a change in the fauna at very roughly 800 and 1 400 m. Four species (*Platysympus depressus. P. compressus*, *P. camelus* and *Paralamprops margidens*) occur only at depths less than 850 m; three species (*S. spinulosus*, *P. peringueyi* and *P. phylloides*) are found between 300 and 1 400 m and three (*B. calmani*, *H. glabrus* and *Hemilamprops* sp.) at 1 200 m or more. Here again valid conclusions are limited by the fact that the greatest depth at which sampling occurred was 1 400 m.

The species-diversity of the family is fairly high. In comparison with the Bodotriidae (which are by far the most abundant locally in terms of numbers, both of individuals and of species (Day 1978)) the figures are as follows: the Bodotriidae, with 4 582 specimens, 42 species and 649 records have a ratio of 7,1 individuals per record and a specimen : species ratio of 109. The Lampropidae, with 169 specimens, 11 species and 39 records have a ratio of 4,3 individuals per record and a specimen : species ratio of 15,4. Thus lampropids occur in fewer samples and are far less abundant where they do occur, but they are far more diverse than are the bodotriids.

Family **Ceratocumatidae** Calman, 1904

Diagnosis

Five free pedigerous somites. Mandibles narrow (boat-shaped) at base. Maxillipeds 2 and 3 elongate, 7-segmented, basis not produced distally. Exopods present at least on maxilliped 3 and pereiopod 1 in both sexes. Propodus of pereiopod 1 with two lobular setose processes. Male with four to five pairs of pleopods. Telson small, unarmed and flap-like, hinged to cover anal valves. Endopod of uropod 1-segmented, exopod 2-segmented with first segment very short.

Type genus

Ceratocuma Calman, 1904.

Remarks

This is the smallest and most recently erected of the seven cumacean families. The combination of four or five pairs of pleopods in the male, together

with a small telson and the setose lobes on the propodus of the first pereiopod, is quite characteristic. However, the telson is very small and is often held flapped over the anal valves so that it is sometimes difficult to detect.

Until 1969, the family was known from four specimens of a single species in two records, one from the north-western coast of Ireland at 705 m and one from about 800 m off Durban. Examination of material from deep waters in the Atlantic has increased numbers dramatically in the last few years so that the family is now known from hundreds of specimens in seven species and two genera. It is expected that further exploration of deep and abyssal waters will continue to provide useful information on this family.

Ceratocuma Calman, 1904

Generic diagnosis

Body elongate, carapace dorso-ventrally flattened with protuberances. Exopods present on pereiopod 1 in both sexes and on pereiopod 2 in the male. Pereiopods 2 to 4 very long and slender, pereiopod 5 absent. Uropods slender and elongate.

Type species

Ceratocuma horridum Calman, 1904.

Remarks

Ceratocuma is easily distinguished from *Cimmerius*, the only other genus in the family, the generic diagnosis of which reads as follows: Body not elongate. Carapace rounded, reminiscent of *Campylaspis*. Exopods present on pereiopods 1 to 4 in both sexes, reduced on pereiopod 4 in female. Pereiopod 5 present. Pereiopods and uropods not particularly elongate or slender.

In general appearance the two genera are quite different, although they both possess the familial characteristics.

Distribution of Ceratocuma

The four species are all known from the Atlantic and southern Indian oceans: one from Ireland and Natal, one from the Puerto Rico Trench, one from the Azores, and one from Panama, but all at depths of 680 m or more.

KEY TO THE SPECIES OF *CERATOCUMA*

1 About eighteen pairs of long, sharp, slender spines on carapace, others on posterior somites; carapace oval in dorsal view and rounded anteriorly (ignoring spines); telsonic somite less than half length of peduncle of uropod ..... *C. reyssi* Jones, 1973—Azores
– Protrusions of carapace (about ten pairs or fewer) and posterior somites confined to blunt spines or rounded tubercles; carapace more or less rectangular in dorsal view; telsonic somite half length of peduncle of uropod or more 2
2 Carapace without paired dorsolateral tubercles or blunt spines: at most with three pairs of very low but extensive rounded protrusions ..... *C. amoena* Jones, 1969—Puerto Rico Trench, off Surinam, Bay of Biscay
– Carapace with several pairs of dorsolateral protrusions, tubercles or blunt spines 3

3 Carpus of pereiopods 3 and 4 twice length of propodus; ischium and merus of pereiopod 1 together about half length of carpus..... *C. panamensis* Băcescu & Muradian, 1974—off Panama
– Carpus and propodus of pereiopods 3 and 4 subequal in length; ischium and merus of pereiopod 1 together subequal in length to carpus.....4
4 All tubercles on carapace, including anterior ones, sharply hooked..... *C. horridum horridum* Calman, 1904—North Atlantic
– Tubercles on anterior half of carapace low and bluntly rounded, on posterior half blunt or sharply hooked..... *C. horridum australe* subsp. nov.

Ceratocuma horridum Calman, 1904

C. horrida Calman, 1904: 37–40, pl. 55 (figs 57–75). Stebbing, 1913: 51–52.

Holotype

Not designated: three male syntypes, two of them mature, deposited by Calman in the British Museum (Natural History). Type locality: 705 m, off Northern Ireland.

Ceratocuma horridum australe subsp. nov.

Figs 15–16

C. horridus: Stebbing, 1912: 142–143.

Records

SM 103	28°31′S 32°34′E	680 m	1 adult ♂: 3,5 mm (holotype); 2 subadult ♂♂: 2,9 mm; 1 ovig. ♀: 3,7 mm; 2 juvs: 2,8 mm
SM 129	30°53′S 30°31′E	850 m	1 adult ♂: 4,5 mm; 1 damaged ovig. ♀
SM 151	30°14′S 30°27′E	900 m	1 ovig. ♀: 5,1 mm; 1 ♀: 3,7 mm

Previous records

Natal, 805 m (Stebbing, 1912).

Holotype

Adult male, in the South African Museum, SAM–A15722, collected by the R.V. *Meiring Naude*, 24 May 1976. Type locality: 680 m, off northern Natal (28°31′S 32°34′E).

Description

Adult male, holotype, length 3,5 mm (SM 103). Integument pale and thin, brittle, faintly reticulate. Carapace (Fig. 15A) large, slightly flattened dorsoventrally, somewhat wider than deep and nearly twice as long as deep; irregularly sculptured to form a number of low, rounded projections. In lateral view, nine pairs visible: one large pair posterodorsally, four closely-adjacent pairs posterolaterally, one pair anterolaterally, one pair immediately above the anterolateral angle, one pair middorsal and one pair midlateral. The same protuberances visible dorsally (Fig. 15B), the four outermost pairs forming the lateral edges of the carapace and causing the lateral outline to be broken;

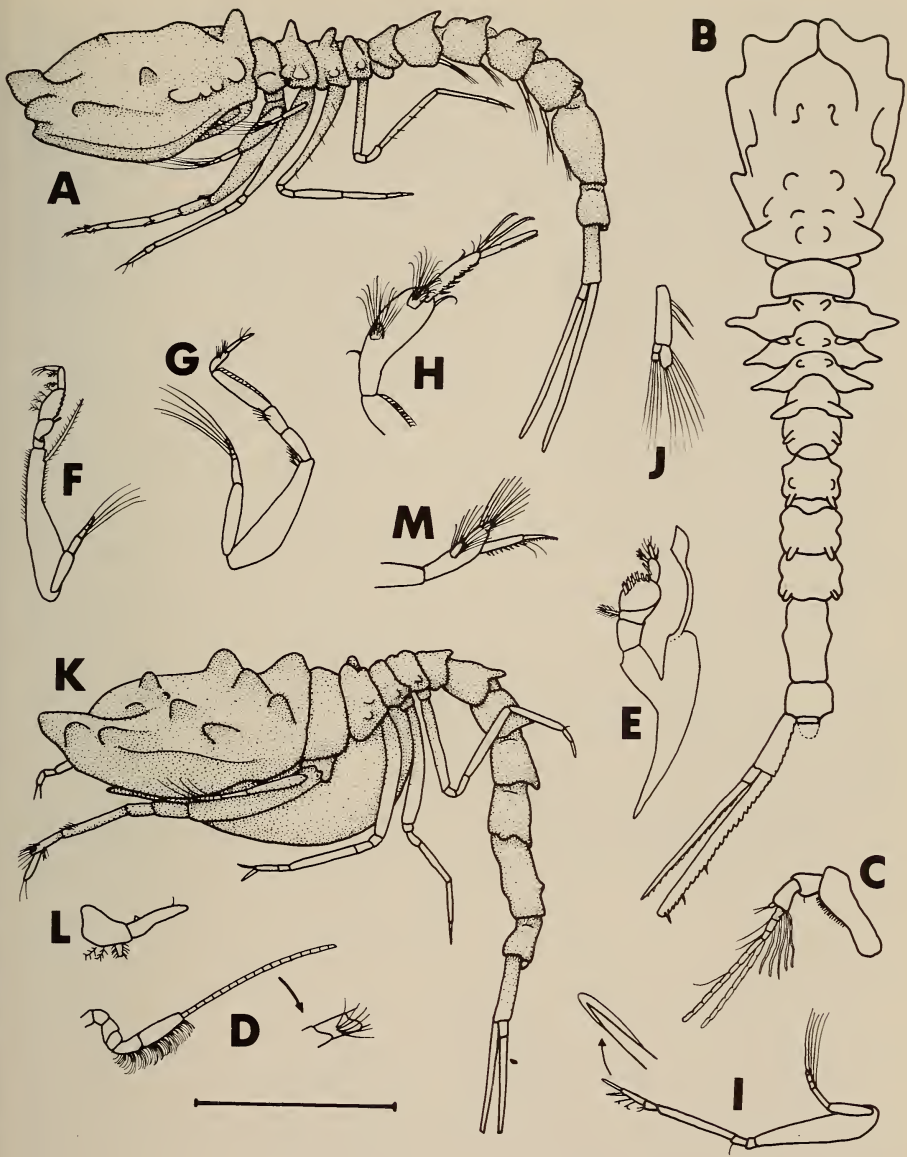

Fig. 15. *Ceratocuma horridum australe* subsp. nov. (SM 103)

Adult male. A. Lateral view. B. Dorsal view. C. Antenna 1. D. Antenna 2. E. Maxilliped 1. F. Maxilliped 3. G. Pereiopod 1. H. Distal tip of pereiopod 1. I. Pereiopod 2. J. Pleopod 3. Ovigerous female. K. Lateral view. L. Antenna 2. M. Distal tip of pereiopod 1.

Scale line = 1 mm for A–B, D, F–G, I, K; 0,5 mm for C, E, J, L–M; 0,3 mm for H.

slightly medial to these are two pairs and the last three pairs are arranged in longitudinal rows just lateral to midline. Middorsal carina absent. Eyelobe small and eyeless. Carapace slightly less than twice length of pedigerous somites together.

All five pedigerous somites visible, first slightly wider than deep without lateral expansions; second, third and fourth expanded ventrolaterally forming wide, pointed lateral extensions and dorsolaterally forming smaller, low protuberances. Last pedigerous somite without appendage, small and similar to abdominal somites. First four abdominal somites produced to slight points dorsolaterally, fifth elongate, sixth small and wider than long or deep. Cephalothorax longer than abdomen.

Antenna 1 (Fig. 15C) short, first segment longer than next two together. Accessory flagellum very small, 1-segmented. Flagellum short, 3-segmented with two aesthetascs.

Antenna 2 (Fig. 15D) shorter than carapace with short, poorly-setose segments.

Palp of maxilla 1 with two filaments.

Maxilliped 1 (Fig. 15E) with a single branchial leaflet; carpus very widely expanded.

Maxilliped 3 (Fig. 15F) normal, merus and carpus very slightly expanded.

Basis of pereiopod 1 (Fig. 15G) subequal in length to next three segments together. Ischium longer than merus, together subequal in length to carpus. Carpus elongate with laminar expansion on inner edge. Propodus (Fig. 15H) with two setose lobes, one at midlength and one subterminally. Dactyl narrow, shorter than propodus, with a number of small spines.

Pereiopod 2 (Fig. 15I) elongate with small exopod. Basis shorter than rest of limb; ischium very short, merus little longer. Carpus elongate, half length of propodus and dactyl together, unarmed. Terminal spine on dactyl with flattened tip.

Pereiopods 3 and 4 elongate, without exopod. Pereiopod 5 lacking (suppressed).

Telson very small, usually folded over anal valves; rounded when extended.

Peduncle of uropod much shorter than rami, serrated on inner edge. Both rami serrated on inner edge, otherwise poorly armed: both appear broken at tip.

Ovigerous female, *paratype*, length 3,7 mm (SM 103). As male, except as follows: carapace (Fig. 15K) with protuberances better developed, also nine pairs: one large pair posterolaterally; two sets of three pairs arranged transversely, the most dorsal pair in each case also being most anterior; two pairs laterally immediately behind anterolateral corner. First two pedigerous somites wider and deeper, all with much reduced lateral expansions, and dorsal expansions hardly evident. Marsupium large and well developed.

Antenna 2 (Fig. 15L) small and apparently 2-segmented. Second and third segments of antenna 1 slightly smaller. Propodus of pereiopod 1 (Fig. 15M) smaller, one of the setose lobes at distal tip; dactyl inserting subterminally

about a third of total length from distal tip. Pereiopod 2 without exopod. Telson slightly rounder and broader. Rami similar but distal tips missing.

Adult male, length 4,5 mm (SM 129). At first glance the two individuals from SM 129 and the ovigerous female from SM 151 look very different from the rest. However, these differences appear to be confined to the sculpturing of the carapace, and the appendages (except for the distal segments of pereiopod 1) are identical in all important respects. The sizes of the individuals also vary quite considerably. But it does not seem possible to pinpoint any really significant differences which would allow specific differentiation and it would therefore seem that we are dealing with a single polymorphic species.

The adult male from SM 129 (Fig. 16A) differs from that figured in Fig. 15A as follows: the five posterior pairs of protuberances on the carapace are drawn out to form distinct points and the anterior pairs are either very much reduced or absent. The tips of these points are very delicate, almost transparent and very easily broken off, so that the apparent degree of development of these may not be of great significance. The expansions of the second and third pedigerous somites and the first four abdominal somites are very much better developed: these too are easily damaged and one is broken off. In dorsal view (Fig. 16B) the second lateral pair of protuberances from the anterior end is

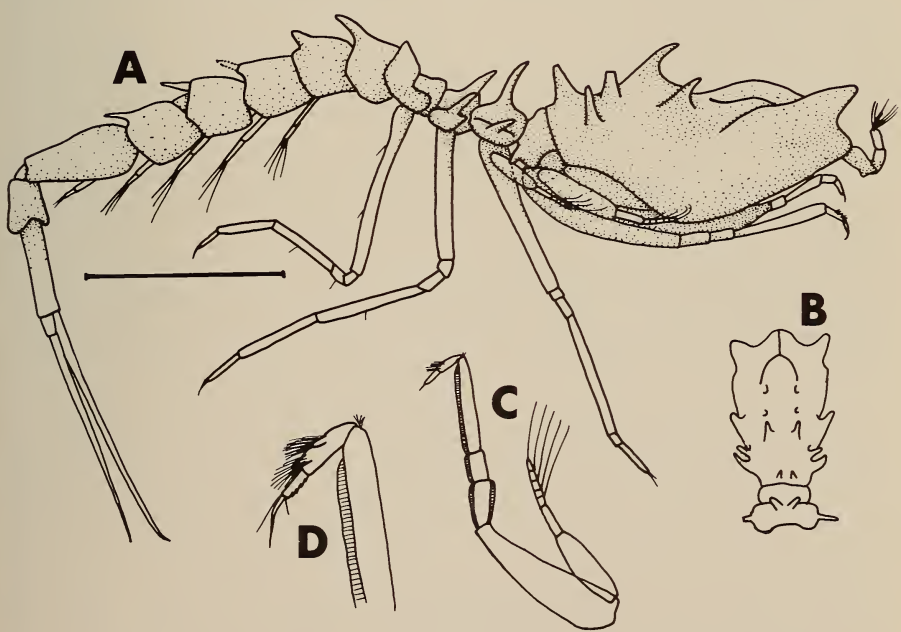

Fig. 16. *Ceratocuma horridum australe* subsp. nov. (SM 129)
Adult male. A. Lateral view. B. Dorsal view of carapace. C. Pereiopod 1. D. Distal tip of pereiopod 1.
Scale line = 2 mm for B; 1 mm for A, C; 0,5 mm for D.

much smaller, the third and fourth better defined and more pointed, as are the two posterodorsal pairs. The ovigerous female is the same in all respects as the male.

Pereiopod 1 of the male (Fig. 16C) differs slightly in that the inner edge of the ischium, merus and carpus have laminar expansions, the carpus is nearly one and a half times the combined length of the ischium and merus and the propodus is shorter (Fig. 16D). The peduncle of the uropod is also slightly longer relative to the fifth abdominal somite.

Remarks

The systematic position of these individuals is not indisputable. The appendages of all four species known so far are very similar, while the sculpturing of the carapace in particular and the rest of the body in general varies quite considerably. *C. reyssi* Jones, 1973, from the Azores, can easily be distinguished by the numerous long, slender spines, not only on the carapace but also on the first, fourth and fifth pedigerous and all abdominal somites except the last. The pseudorostrum, too, is pointed anteriorly without a broad, flanking projection on either side. There are other minor differences in the proportions of the limbs as well, so that this species is clearly distinct from the others.

C. amoenum was described by Jones (1969) on the basis of the cephalothorax of a single male from the Puerto Rico Trench. He has since (pers. comm.) found undamaged specimens of the same species from Surinam and the Bay of Biscay in which the sculpturing of the carapace is the same as that figured and which species he confirms to be easily distinguishable from *C. horridum* in all cases. It is further distinguished by 'the uropod peduncles being relatively long (compared with *C. horridum*) in proportion to the rami', and some fully adult males have only four pairs of pleopods. *C. amoenum*, then, is also clearly distinct.

C. panamensis Băcescu & Muradian, 1974, from north-east of Panama, differs from *C. horridum* in the smaller number of protuberances on the carapace and thorax and the proportions of the distal segments of the pereiopods. As the authors point out, it is very close to *C. horridum*; certainty about the validity of the species will have to await the collection of adult males.

C. horridum was described by Calman (1904) on the basis of three males, two of which were mature. Jones (pers. comm.) has since found large numbers in the North Atlantic and off Surinam, all of which clearly belong to Calman's species. Stebbing (1912) identified (but did not figure) a single specimen from Durban as *C. horridum*, saying that it differed from Calman's description and figures only 'in a small bulbous expansion of the base of [the] peduncle (of the uropod)'. The several other specimens now available from South Africa are problematical. Some approach *C. amoenum* in having low protuberances on the carapace, while others are very similar to Calman's description of *C. horridum*, having long, slender spine-like processes. However, close comparison of the structure and positioning of the protuberances in the present specimens

shows them to be very similar to each other, although the magnitude of the sculpturing differs considerably. The sculpturing—in the form of sharp digitiform processes in some cases and merely raised bumps in others—is very similar in arrangement to that figured by Calman for *C. horridum*. The structure of the limbs is almost identical in both South African forms and in the description of *C. horridum*, confirming that they are very similar. It therefore seems appropriate to consider these specimens as belonging to *C. horridum*.

Even in those specimens in which the carapace most closely approaches that figured by Calman, the sculpturing is greatly reduced anteriorly and the dactyl of pereiopod 1 inserts terminally on the propodus. In those specimens with all the sculpturing reduced, the dactyl inserts subterminally, as it does in Calman's figure. Since the central and northern Atlantic form of the species seems to be quite uniform, it is proposed to distinguish the local specimens subspecifically as *C. horridum australe*. Due to the considerable variation within as well as between samples, even the subspecies must be considered at least to be highly polymorphic. Whether this polymorphism will prove sufficient for erecting two species or subspecies in the place of *C. horridum australe* will have to await the collection of a much larger number and wider range of individuals. At such time, it should also be possible to determine the relationship between the local subspecies and *C. horridum sensu* Calman.

Distribution

Natal from 680 to 900 m.

DISTRIBUTION OF CERATOCUMATIDAE

With the family consisting of only seven species in two genera, it is not possible to draw many inferences from its distribution. It is worth noting, however, that all seven species appear to be confined to the Atlantic and southwestern Indian Ocean (including Kerguelen). They are cold- and deep-water forms, the depth at which they are found being reciprocal to the latitude, except in records from the deepest waters.

Anatomically, *Ceratocuma* appears to form a cline of species differing mainly in the sculpturing of the carapace but its distribution in the Atlantic is rather haphazard and available evidence shows no relationship between morphology and geographical distribution.

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